THE IRON AGE

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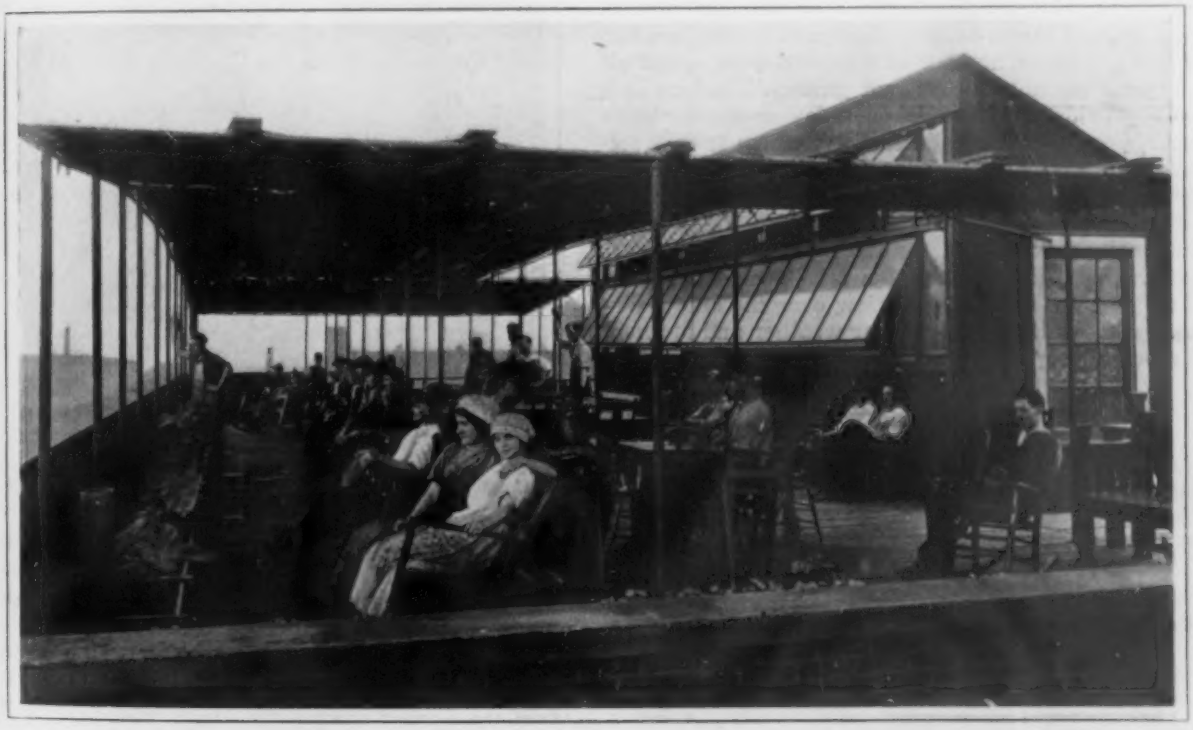
Roof Garden Located on Factory Building

Cleveland Hardware Company Provides Comfortable Place for Recreation and Rest for Employees During Noon Hour—Other Welfare Work

BY F. L. PRENTISS

Acres of roof space on manufacturing plants are going to waste because they are not being utilized. Many plants have been developed to the highest point of efficiency with the cutting of cost by improved factory methods, proper care of employees and the use of every foot of available floor space, but up above the roof there is a lot of space that is seldom made use of. This space may be regarded as of little value in the case of low factory buildings located in outlying districts where building sites are comparatively cheap and so situated that they have around them an expanse of lawn or at least enough room for the workers to get out for a little fresh air and recreation during the noon hour. But if the factory is hemmed in on all sides by other buildings and narrow dirty streets, noisy with traffic, the roof becomes an asset that if properly utilized and with a small outlay helps to increase the efficiency of the plant by affording the employees a place for noonday recreation and the enjoyment of sunshine and fresh air.

The Cleveland Hardware Company, Cleveland, Ohio, is one of the first companies to utilize its roof for the benefit of its employees in connection with its welfare work. When this company erected a six-story addition to its No. 1 plant it conceived and carried out the idea of having a roof garden. The construction of the building with several sawtooth roof sections left a level gravel covered roof space at the front, approximately 40 x 80 ft. in size. To utilize this space the gravel roof was covered with flooring and above it a canvas canopy was placed, this being held in position by iron supports. As the brick side walls extend far enough above the roof floor to make a safe inclosure, little else was required to complete the roof garden, except the furnishings. These include easy chairs, tables and a number of porch swings. A large number of foli-



By Providing a Canvas Awning, Swings, Easy Chairs, Tables and Flowering Borders and Even a Talking Machine, a Part of the Roof Becomes Popular with the Employees in the Noon Hour

Women Employees Being Taught English at Night School

age plants are placed around the sides to add to the attractiveness. When the weather becomes too cold in the fall to use the roof, the canvas covering is removed and the iron framework to which it is attached is taken down and stored away until spring. Easy access to the roof is provided by elevators, which carry the employees to the top floor. A wide iron stairway similar to those connecting the lower floors leads to doors opening directly on the roof.

The roof garden is open to the factory employees, both men and women, from 11:30 to 12 noon and to the office employees from 12 to 1 o'clock. Tables are provided so that those who desire may eat their lunches on the roof. The company has furnished a talking machine with records and the rendition of musical selections on this instrument is a part of the noon-day programme. In pleasant weather a large number of the employees spend all the time possible in the roof garden. Before this was provided their idle noon-day moments were usually spent within the factory, which is in a solidly built up manufacturing district so that the only ground space available for outdoor air and recreation was the pavement and sidewalk. The plant is unusually well located for the roof garden, as it is only about the distance of a city block from Lake Erie and the roof gives a view over the lake a distance of over 20 miles in clear weather and is swept by refreshing lake breezes in hot weather.

A ROOF DINING ROOM

In addition to the open air roof garden the company has built on the top of the old section of its plant an independent frame structure used for a dining room for the office employees and shop foremen and for recreation purposes during the noon hour when the weather is not suitable for using the open air garden, and for dancing and other use in connection with the various phases of the company's welfare and educational work. This provides one large room about 40 x 125 ft. in size with ample window surface that makes it about as light as a sun parlor. One section of the room is arranged so that it can be partitioned off with curtains for stereopticon lectures and motion pictures.

Lunch Room for Women Employees

LUNCH ROOM PROFITS BUY PHONOGRAPH

Included in the welfare work is the employment of a teacher, who during the past season gave 15 to 20 min. instruction in folk dancing to the women employees. In the coming winter a course of instructions will be given in domestic science. In the lunch room for the women employees, coffee, sugar, cream and one cracker is furnished by the company for 1 cent, the remainder of the lunch being brought by the employees from their homes. A very interesting fact in this connection is that enough profit has been made from this 1 cent charge to buy the phonograph and 25 records used in the roof garden and to pay the folk dancing teacher. One of the illustrations is a view of the section of the lunch room for women employees, which is presided over by a matron, who prepares the coffee.

By Locating the Safety First Bulletin Boards at Time Clocks the Employee Has a Daily Reminder to Look Out for Himself and Others

Another view shows a class of women employees being taught English by the Roberts oral method. This course of instruction was given in the plant two evenings a week last winter under the direction of the Y. M. C. A. In the line of educational work there is an educational committee of office employees which has arranged a course of lectures to be given for a half hour every Friday noon from October until spring for the benefit of the 125 employees. The speakers will include prominent men of the city, who will discuss various topics with which they are most familiar, the programme being both educational and entertaining in character.

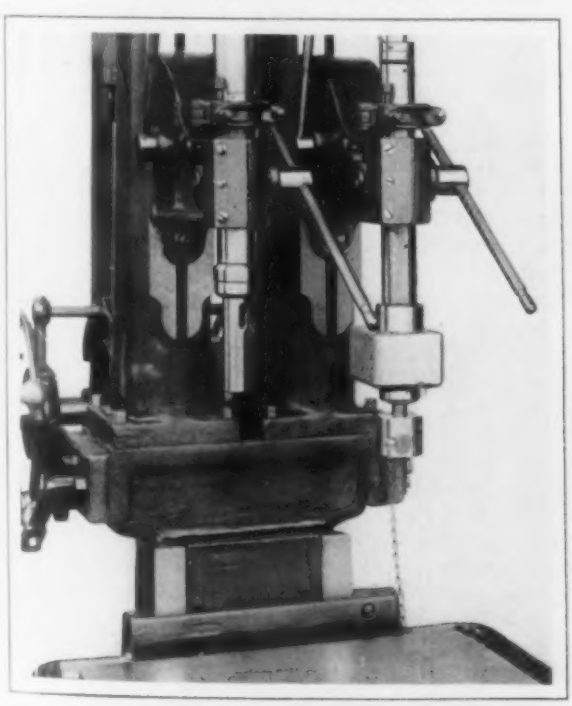
A safety first bulletin board used by the company is shown in one of the illustrations. Two of

these are located in each plant near the workmen's time clock. In the center at the top of the board is the word "danger" in a bright red oval space and below this the words "Safety First" appear in large white letters. Under this in small letters is this official notice: "All employees are hereby notified not to use machines that are out of order or where safety guards are not properly attached and no foreman or superintendent has authority to order an employee into an unsafe position." The large blank space on the lower part of the board is used for posting special factory safety notices and printed circulars of an educational character relating to safety matters. The principal purpose of these boards is to keep the subject of safety definitely before each workman. No employee on entering the plant can fail to see one of the safety bulletin boards so that his attention is called to the necessity of caution every time he starts to work.

Tapping Fixture with a Direct Drive

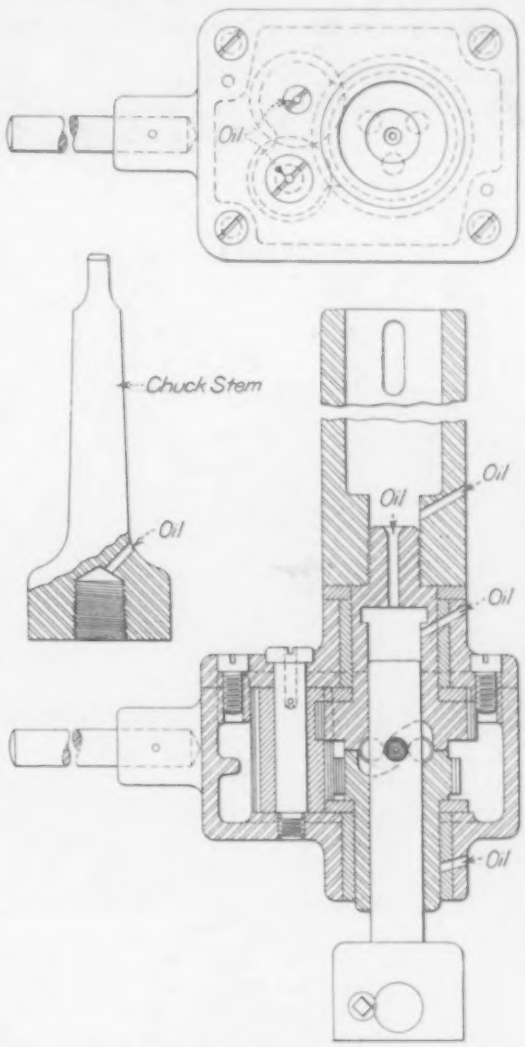
A direct drive and a geared reverse are features characterizing a tapping fixture that has been brought out by the Henry & Wright Mfg. Company, Hartford, Conn. The fixture has two working parts and it is pointed out that rigidness is secured through the closeness of the bearing and vibration is also eliminated in the same way. When the fixture is driven from the nose of the drilling machine there is a direct drive to the chuck in which the tap is mounted. The driving stems are made of tool steel with high-grade balls and the parts are interchangeable with easy access for inspection.

The tapping fixtures are made with a No. 2 Morse taper shank or with a sleeve to fit over the nose of the spindle with a key running through the tang hole. Both of these arrangements are illustrated in the line drawing, but the arrangement that is recommended by the builder is that shown in the halftone where the fixture is attached as a part of the machine. In this way it is pointed out that it is possible to take the arm and the spindle out of the machine and remove the fixture to another tool where tapping is to be done. The drilling spindle is then replaced on the first machine and in this way it is possible to utilize both spindles for drilling instead of having one in use except when tapping has to be done.



A New Tapping Fixture Having a Direct Drive and a Geared Reverse Applied to an Upright Drilling Machine

Two sizes of fixtures are made at present, one of which, the No. 4, will drive taps up to a maximum diameter of ⅜ in., while the other, which is designated as the No. 5, will handle taps up to ½ in. in diameter. A recent test was made in the builder's factory in tapping small parts made of malleable iron. In this test the fixtures were used with a ¼-in. No. 20 tap which was driven to the bottom of a hole ⅜ in. deep at the rate of 1000 per hr. In the test the first tap broke after 19,366 holes had been tapped.



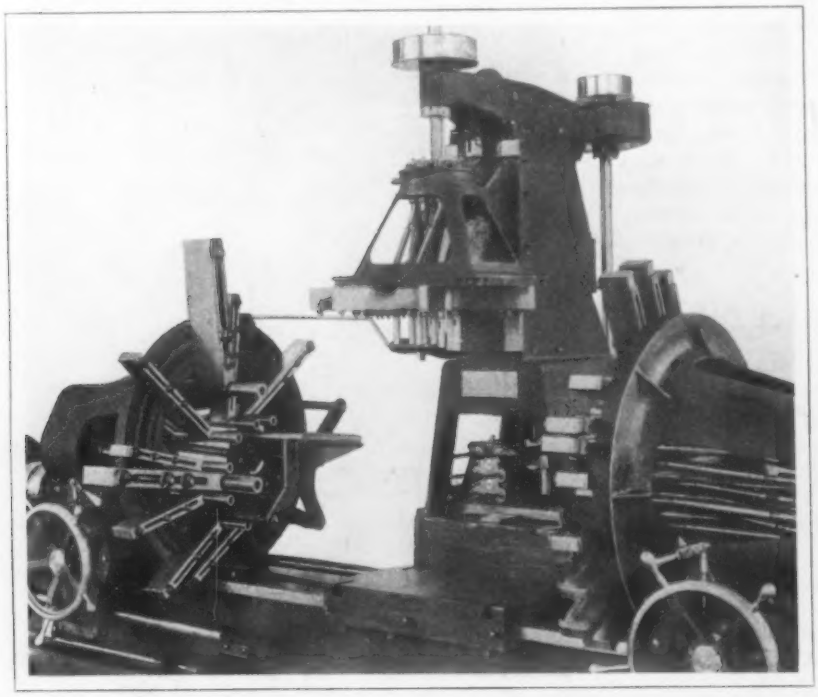
The Details of the Fixture

The Bureau of Labor Statistics of the Department of Labor has just published as its bulletin No. 148 a compilation of the labor laws of the United States with brief notes on court decisions. This is the fifth such compilation which has been issued by the Commissioner of Labor Statistics since the organization of the bureau in 1884, the last preceding compilation having ended with the legislation of the year 1907. The present work is in two parts, of about 1200 pages each, and includes the laws of all the States and of the United States up to the close of the year 1913. The compilation includes also the orders of the industrial commissions of New York and Wisconsin, which have the force of laws. A mine of information is here furnished for any one interested in labor legislation, the work being practically indispensable to any student in this field, owing to the wide distribution of the material in the various State codes and session laws, which have been searched page by page to locate the desired material.

A 46-HOLE DRILLING MACHINE

Automobile Tool, With Independent Spindle Speeds and Feeds, for Use in Four Planes

The adaptation of a number of standard heads is the special feature characterizing the four-plane multiple drilling machine that has recently been developed by the Baush Machine Tool Company, Springfield, Mass. The machine is intended for drilling all of the holes in the transmission case of an automobile, 46 in all, simultaneously. The machine is arranged for convenience in operation and is said to be very flexible. The machine can, of course, also be used for other work of a similar character where various arrangements of different sized holes have to be drilled.



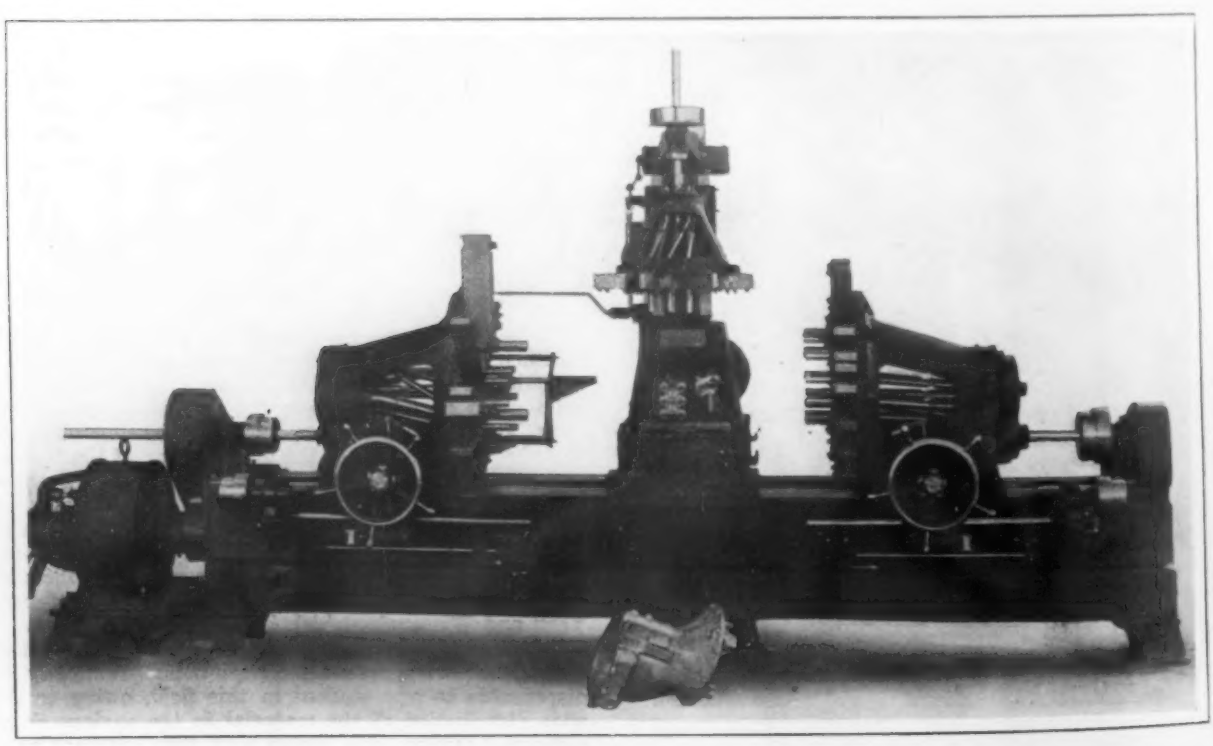
View of the Four Heads Showing the Arrangement of the Different Spindles

All of the heads have automatic feeds and feed stops and the low back heads are arranged to swivel at an angle. In addition, the latter are also adjustable for position, so that a great variety of different drilling layouts may be obtained. In this way the holes are drilled irrespective of size, position or angle, as each drill runs at the proper speed and is driven by a spindle of suitable size and supported by an arm. Independent adjustments are provided for different lengths of drills, a single screw on the extreme outside of the arm controlling it. This arrangement, it is pointed out, enables close center distances to be secured, as there are no bolts or nuts projecting from the arm, the inner end having the same diameter as the spindle nose. All of the gearing is protected by guards and the spindle driving gears run in oil valves in tight cases.

Canadian Ship Subsidies

In an article contributed to the Consular and Trade Reports, Consul General R. E. Mansfield, Vancouver, British Columbia, says:

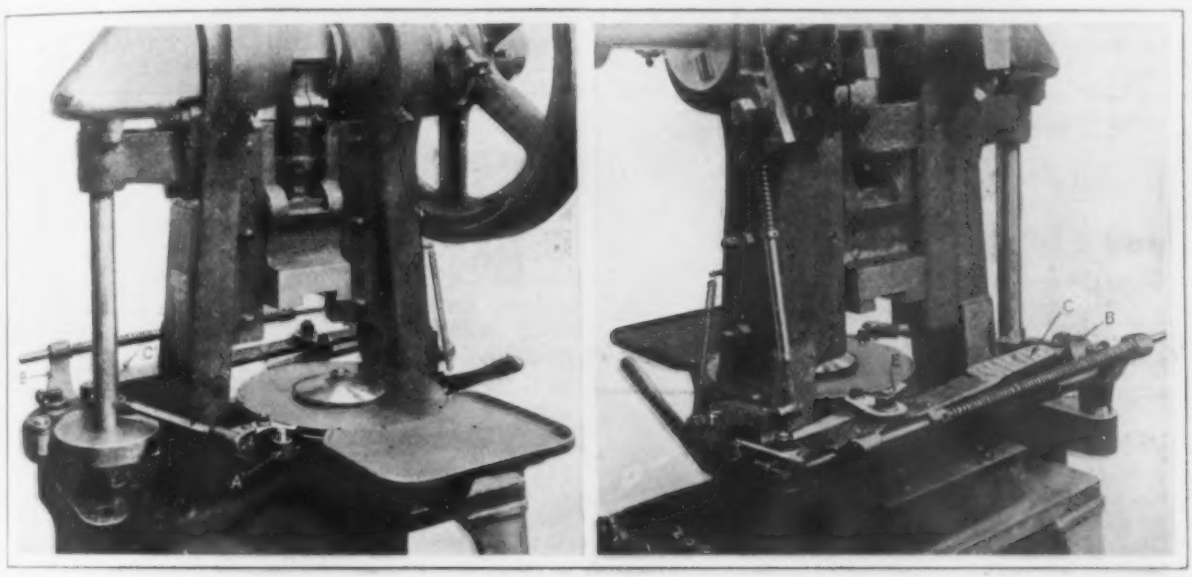
"In subsidies to steamships in 1914 the Canadian Government will pay $2,238,600. For this sum the mails are carried free and freight and passenger service maintained on the ocean and coast routes for the development of foreign and domestic trade. On the Pacific there are several ocean-service contracts, chief of which is that between Vancouver and Hongkong, China, with calls both ways at Yokohama, Japan. This service is performed by the Canadian Pacific Company, the yearly subsidy being $225,000, of which Canada pays $125,000 and Great Britain $100,000. A subsidy of $180,000 yearly is paid for a monthly service between Vancouver and Auckland, New Zealand. The Canadian Government therefore pays about $305,000 in subsidies for the Pacific coast." Thus does the Dominion seek to promote its export trade.



A Machine Recently Developed for Drilling 46 Holes in an Automobile Transmission Case Simultaneously

New Line of Single-Acting Pillar Presses

The Waterbury Farrel Foundry & Machine Company, Waterbury, Conn., has brought out a line of pillar presses equipped with ratchet and friction dial attachments. The machines are designed so that the two attachments are interchangeable and four sizes of machines are constructed in the so-called short stroke machines, while four other patterns which are practically the same except that they can be furnished with the long stroke supplement them. There are no specially novel features in the friction dial attachment except that it is arranged so that the work can either be carried through the dies or brought up by the knockout so that it can be knocked down from the top of the dies, an attachment being furnished for this purpose. In operating this machine the only precaution necessary is for the operator to set the work right side up on the dial as the machine can be operated at a very high rate of speed, although it is useful only for one operation and for round work.



Two Views of the Bed of a Recently Developed Line of Single-Acting Pillar Presses Showing the Application of the Ratchet Dial Feed

The general appearance of the machine is the same as others of the type now on the market. In the construction of the ratchet dial type, the pawl is mounted on an arm, A, which holds it in an arc around the center of the dial. The connection D is attached to the end of the pawl, which is shaped like a bell crank, and has a stop to limit this motion, while the arm A has a friction at the center which is covered up with the washer that is used to keep the dial in place on its bed. The connection D is operated by an arm, C, which is centered back of the right upright of the press. The roll arm B operates this arm, the two being connected by an adjustable sliding block so that the number of notches in the dial which are used can be varied from 12 to 24. A spring, which is located so as to act on both arms B and C, is employed to return the pawl and the pawl driving mechanism, this construction being relied upon to keep back lash out of the mechanism and make the safety device more positive than would be the case if the levers were permitted to get loose at the joint. The timing of the dial operating cam, which is mounted on the side shaft that is driven by bevel gears on the left end of the crankshaft, is such that the dial starts to move forward when the press gate is half way up and the indexing is completed at or before the time when the gate reaches the highest point of its stroke. The cam holds the pawl in this position until the gate is practically down. By this time the tools have entered into the dial so that before the pawl releases all possibility of getting the dial out of place, it is pointed out, is passed and it is practically impossible to move the dial during that part of the stroke of the press or when the press is coming down, as it would be necessary to force the pawl out on a 14½-deg. angle against the friction on the arm A. When the pawl starts to return the first portion of its motion is taken up by lifting it out of the dial notch until it hits the stop on the lever A which is carried back until it is in the right position to enter the next notch. During this time the gate is moving upward and if the dial is not indexed to the right position, due to breakage of any part or some other accident, the locking lever E, which is mounted on the lever C, will not enter the slot, while the other end of the former will engage with the stop on the lever F, holding it up and stopping the press with the gate up. The construction of the levers in the rear, it is pointed out, leaves the whole back of the press open so that the tools can be slid from under the dial without disturbing it or the table. If the knockout should fail to bring the work out of the die or the bottom of a shell should become punched out in drawing through, leaving a shell between the die and the dial, reliance is placed upon the design of the connection D to bend or break before any other part gives way.

The clutch furnished on these machines is of the standard key type and the knockout is worked from cams which act directly on the end of a straight knockout rod. In this way, it is pointed out, special cams can be made if necessary and the knockout motion can be easily changed to suit the work at hand.

All of the gears of the machine are protected by guards and a table is furnished for holding the work together with a shelf on the side for the wrenches that are usually furnished with the machine. A hand lever at the side or a foot treadle is employed for controlling the operation of the machine.

The Dominion Department of Labor says Canada is enjoying industrial peace, there being no labor disputes of note.

Emergency Stretcher and Safety Bulletin at Entrance

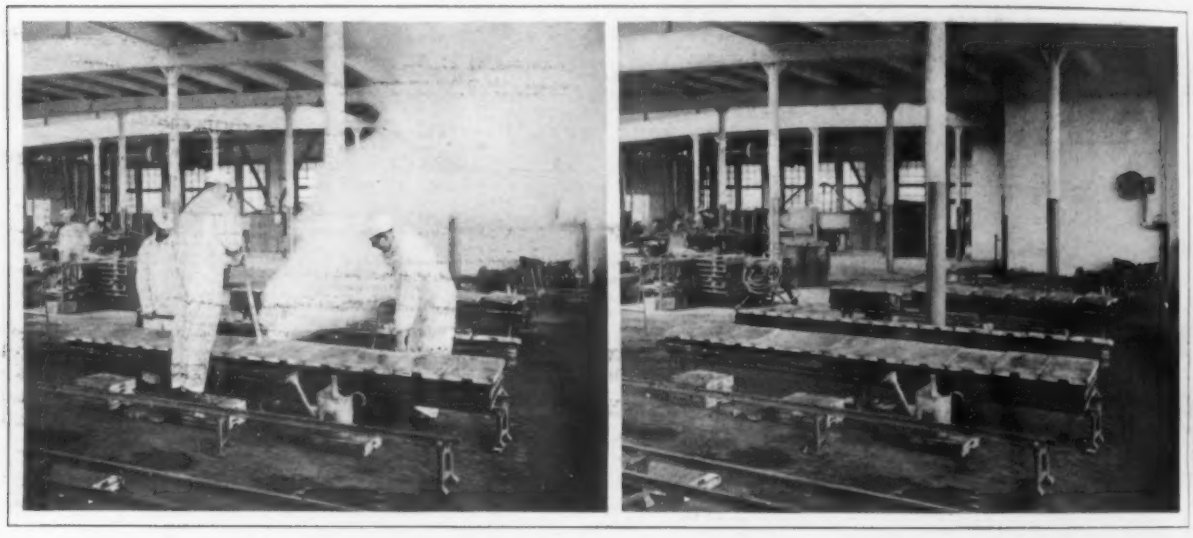
Sanitation and Safety First Applied to the Brass Industry*

Unusual Regulations at the Pullman Works to Safeguard Health—Protective Measures for Machinery

BY F. MOERL†

Great sums of money are spent these days in safety work with no direct cash returns, but in carefully scrutinizing results we will find it a movement not alone one of humanity, but also one of economy. For instance, a man working on a certain machine is injured and incapacitated for a week or two. It may require the machine to stand idle, or as is usually the case, the injured man is replaced temporarily by one not so familiar with that particular job. Consequently the output will not come up to the usual quality or quantity, which means a financial loss to the firm. How much better a man can work in a clean, well-lighted and well ventilated foundry or finishing shop, than in one presenting opposite conditions, is well known.

At the Buffalo convention of the American Institute of Metals, in 1912, Dr. Charles L. Parsons, representing the United States Bureau of Mines, brought up the subject of health conditions in brass foundries, and the discussion which followed demonstrated that many of those present were keenly interested in this problem of conserving human energy, and that several of the industries represented had already installed shower baths and other sanitary equipment.



Pouring Brass at the Pullman Works—Men Clothed in White. Same Room as that Shown at Left 30 Sec. After Pouring

July 1, 1911, the occupational disease act became effective in Illinois, and at first the attitude of many of both employers and employees was more or less hostile. Some employers, considering it a new-fangled fad, reluctantly complied with provisions of the law and then only to such extent as to be within its absolute requirements. Others willingly and cheerfully installed the necessary equipment, and even went beyond that which was expected of them in providing safety and sanitary measures.

On the other hand, the men did not unanimously welcome the law as one made primarily for their welfare, and displayed more or less antagonism. They regarded the compulsory compliance on their part as an encroachment upon their personal liberties. At the Pullman Company's plant in Pullman, these conditions have been practically overcome, and what is now commonly known as the "safety first" movement is being more and more advanced by both management and employees.

As my duties require the supervision of the

*Paper substantially in full read before the foundrymen's meetings, Chicago, September 8.

†Pullman Company, Pullman, Ill.

The First-Aid-to-Injured Jar, in an Opened Cabinet, in a Wash Room

manufacture of trimmings for approximately 2000 cars a year, taking in not only Pullman, but also various contract cars for the different railroads, my observations of the safety work are practically limited to the brass department, and outside of that I can speak only in a general way.

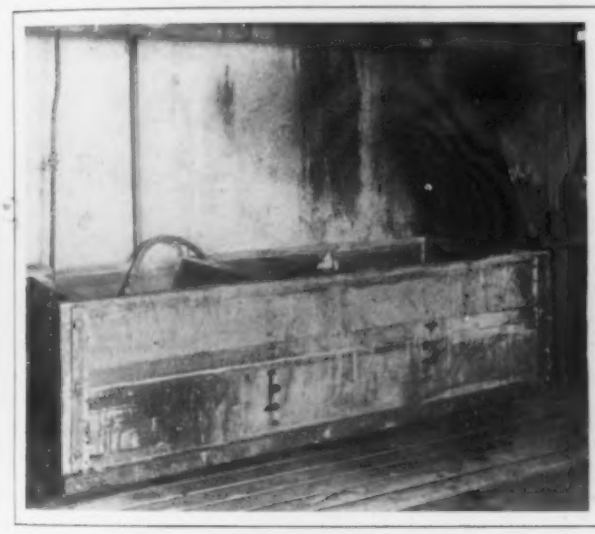
That portion of the work directly affected by the Illinois occupational disease act is in charge of the safety department chief clerk, and it is his duty to supervise and regulate the medical examinations, baths, changing of overalls, jumpers, towels, etc., making proper entries on forms gotten up for that purpose. Molders, grinders, coremakers, melters, in fact all brass foundry employees, including the office force, polishers, buffers, platers, painters, glaziers and sand blasters, come under the supervision of this end of the department. The safety engineer investigates and recommends relative to the compliance with federal, state and city laws and ordinances regarding matters of sanitation, buildings and prevention of accidents. This end of the safety department takes in the entire plant.

Before we can put a man to work at any of the named occupations, he must first undergo a medical examination, made by the company's physician, who reports on a regular form as to the applicant's health. When the application has been approved, the man may be put to work, but before commencing the safety department furnishes him with a pair of white overalls and jumper, towels, nail brush, and, if necessary, goggles, respirator, rubber gloves or rubber apron. The goggles are supplied to grinders; rubber gloves and respirators to sand blasters. A proper record is kept of this transaction, and when leaving the company's service these articles must be returned to the safety department, where they are properly sterilized.

Suitable shower baths are installed, and it becomes obligatory on the man's part to take a shower bath at least one each week, a certain time being allotted each department or part thereof for that purpose. One-half hour is allowed by the management for each man every week, and no deduction of time is made while taking the bath. Once, and in some cases, twice every week, he turns in his soiled overalls and jumper and is furnished a freshly laundered set. The towels are also frequently changed the same way and the respirators cleaned and sterilized at regular intervals.

Each employee coming under the regulations of the safety department is allotted a two-compartment steel locker, equipped with a small mirror, proper shelving and suitable coat and hat hooks. Locks are fitted to individual keys; the keys are fastened to a key ring, together with the employees' gate house brass check. The lockers are divided into an upper and lower compartment; the upper for the street clothes and the lower for the shop wearing apparel, and are so located in the different washrooms as to allow sufficient room for changing from street to shop clothes or vice versa. The washrooms are equipped with long, and in some cases, individual wash basins. The large ones have a number of faucets with running water, the latter being properly mixed to a suitable temperature in an adjacent

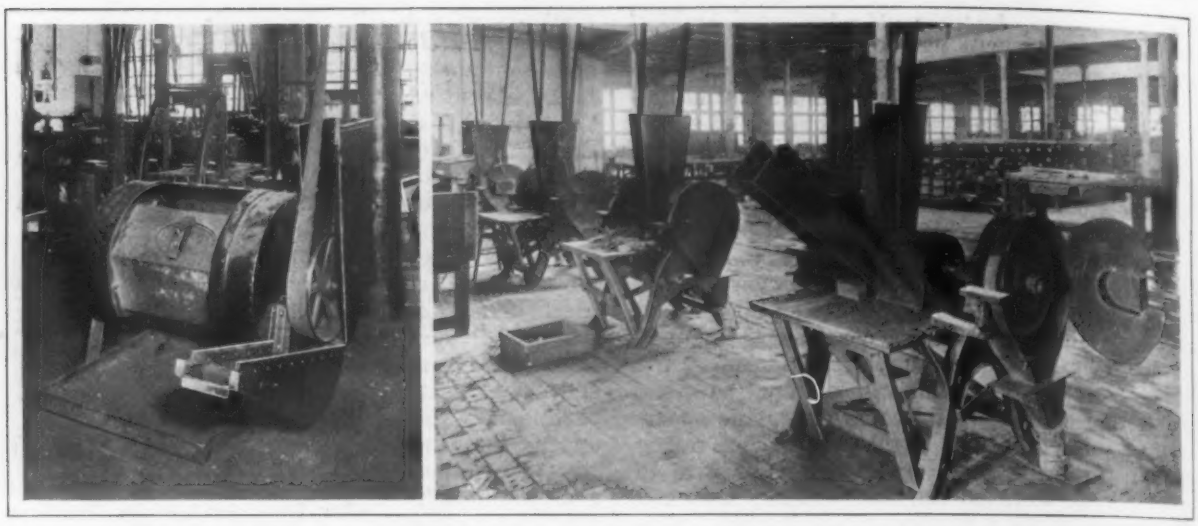
X-Ray Room for Locating Fractures and Other Injuries



An Exhaust Fan Connection Serves the Dipping Tank

The Sand Blast Operatives are Protected by Hoods as Shown

Mixing Chambers and Liquid Soap Provided in Shower Baths



The Tumbling Barrel, at the Left, Has an Enclosing Guard as Well as its Belt Drive, the View Showing the Barrel Guard Cover Rolled to Give Access to Barrel; at the Right is Given an Idea of the Extensive Use of Hinged Guards, These in the Polishing Room Which Has of Course Local Exhaust Systems

large tank. Liquid soap containers are placed at regular intervals. Ten minutes prior to quitting time, these washrooms are opened to the men to wash in and change clothes, and by the time the whistle blows they are all cleaned up, and in leaving the works many might well be taken as belonging to the office force.

Every employee in the brass foundry and finishing departments must undergo a medical examination once every month, and if found affected with plumbism, or any disease peculiar to the trade at which he is working, he is most closely scrutinized with a view of overcoming the cause of the ailment, which usually results in the correction of some slight improper practice and the consequent disappearance of symptoms. In the more severe cases and those where no other correction can be made other employment is found, but even then the case is kept under the doctor's surveillance until complete recovery.

One of the great problems in the brass foundry and brass finishing shop, is that of ventilation. While the construction of some of the older buildings is such as to necessitate artificial means of removing fumes and foul air, yet buildings of more modern types are, or should be, so designed as to insure natural ventilation by providing sufficient windows and skylights, which can be easily and quickly opened and closed. In summer-time this will work out without any great difficulties, but in cold weather we find that the men object more or less to the opening of the windows, and some would rather inhale the metal fumes. In such cases we found that the factory inspector insisted upon opening up everything during pouring time. In the accompanying illustrations will be found reproductions of two photographs. One picture was taken while pouring, and the other was snapped in the same position as soon as the smoke had cleared away, which was only 30 sec.

The floors in the brass foundry should be kept moist at all times, and one of the laborers delegated to use the sprinkling can liberally. Under no circumstances should any one be allowed to eat lunch in the foundry, polishing or plating rooms, and suitable places should be provided for that purpose. The Pullman car works was one of the first shops to meet all, and even went beyond the requirements of the occupational disease act, and the management at all times is willing to consider any new safeguarding device, or suggestions of health measures.

What in Brief is Done to Minimize the Possibilities of Occupational Disease in the Pullman Works

Applicants are given a medical examination.

Employees are given a medical examination once a month.

White overalls, towels and nail brushes are supplied.

Goggles are provided for operatives at grinding machines.

Rubber gloves and respirators, periodically sterilized, are given to men engaged at sand blasting.

Time is allowed once a week for a shower bath.

Liquid soap is provided at wash basins and 10 min. allowed before quitting for washing.

Lockers have two compartments, one for street and other for shop wearing apparel.

A commodious lunch room is one of the departments of the plant, as workmen are not allowed to eat in working rooms.

A suggestion box forms part of the safety bulletin boards.

There are 28 first-aid cabinets and an X-ray room as well as regular hospital room.

The average time lost for each employee per month has gradually dropped from 48 min. in January, 1913, to 14 min. in May, 1914.

In 1913, 12 per cent. of the employees lost 1 day or less on account of accident; 18.5 per cent. lost 1 to 5 days; 8.2 per cent. lost 5 to 10 days; 9.7 per cent. lost 10 days and over, and 51.8 per cent. lost no time whatever.

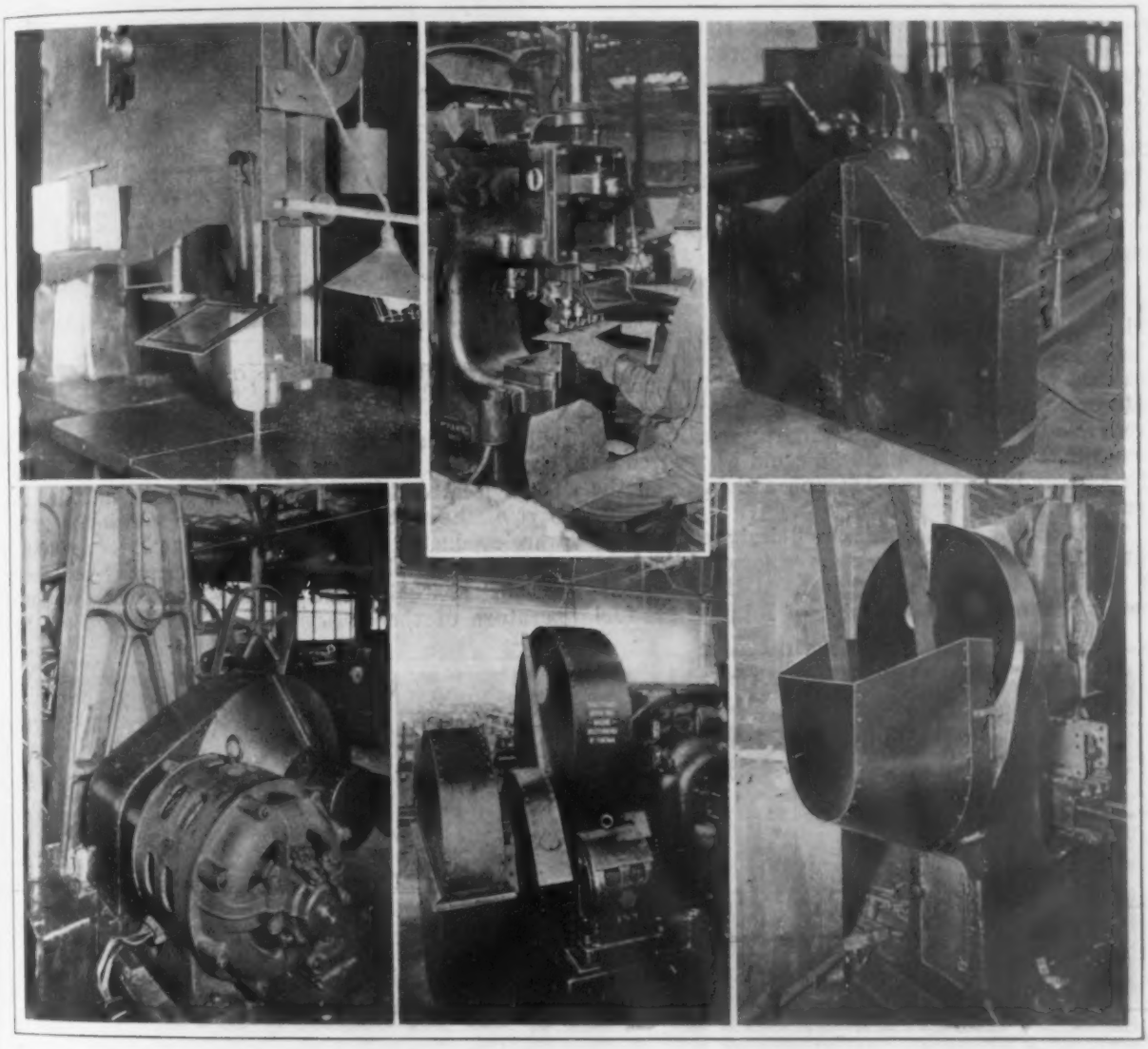
Emery wheel exhaust heads and guards were designed and made in our own plant. The exhaust heads are made of ⅛-in. sheet iron, and the guard bands of ¼-in. boiler plate, assembled by oxy-acetylene welding. The whole head is arranged to slide, so as to take up for the wear of the wheel. The lower portion of guard front can be adjusted so as to close off that part of wheel not in use. The lid for removing the wheel is hinged, and when closed is fastened by a catch, as well as a bolt and nut, serving as stress members in case the wheel bursts.

Our shower baths are equipped with a mixing tank, which is supplied with hot and cold water, regulating it to a suitable temperature. They are grouped in sets of seven, each again sub-divided by canvas curtains, for the individual bath. Vapors are drawn out by large natural draft ventilators, placed in ceiling or side wall.

We have 28 first aid cabinets placed around the different departments of the works and about 70 men are trained to do first aid work. The first surgical attention is received in the first aid room, and in case of fracture the X-ray apparatus is used for determining the mode of procedure. Photographs are taken of all fractures. While we term it the first aid room, the equipment and facilities are sufficient for handling any minor or more serious operations.

To clear a dipping room from the obnoxious acid fumes is a difficult task. After trying out various schemes and ventilating systems, we found an 18-in. wall type fan run at 1700 r.p.m. direct connected to a motor, the most effective. The motor must be either encased or the fan shaft extended into the next room and there connected.

Guards completely enclose the tumbling barrels and also the belts up to a man's hight. The belt guard is arranged to open easily and quickly in case of belt repairs. The portion of guard over the tumbling barrel proper can be opened similar to the roll top of a desk.



Some of the Forms of Machinery Guards Used in the Pullman Works. At the upper left is an enclosed band saw equipped also with a glass eye guard; at the upper right is a guarded lathe. At the lower right is a vertical slotting machine with open guard to the cone pulley

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A night school for employees has been organized by the Cleveland Crane & Engineering Company, Wickliffe, Ohio. It meets every Tuesday evening in the town hall and is open not only to the employees but to any one in the town who wishes to take advantage of the opportunity. Instruction is given in elementary mechanical drawing, free hand sketching, arithmetic, geography, history and shop problems. Lectures in these and other subjects are also to be given. About 50 men and boys were present at the first meeting.

An export shipment of 5000 ft. of Longlife conveyor belting was recently made by the B. F. Goodrich Company, Akron, Ohio, in response to a cable order. The shipment was made in 10 rolls and weighed some 18 tons.

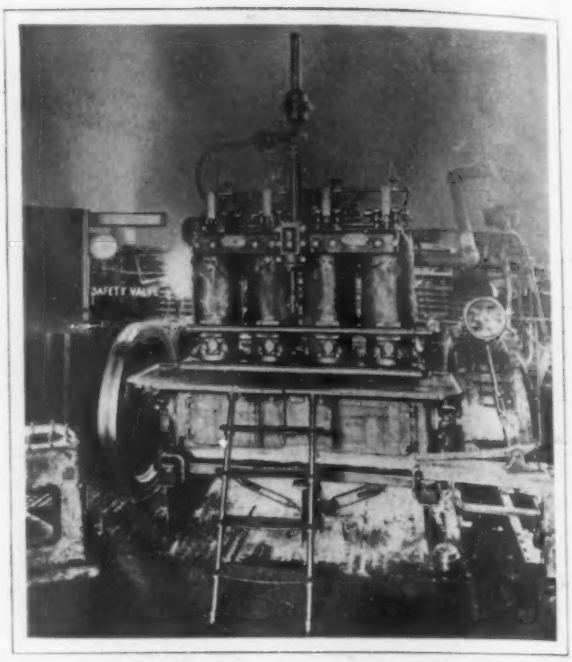
STEAM AS A BY-PRODUCT

Utilizing Gas Engine Jacket Water — High Velocity of Flow to Prevent Loss of Heat

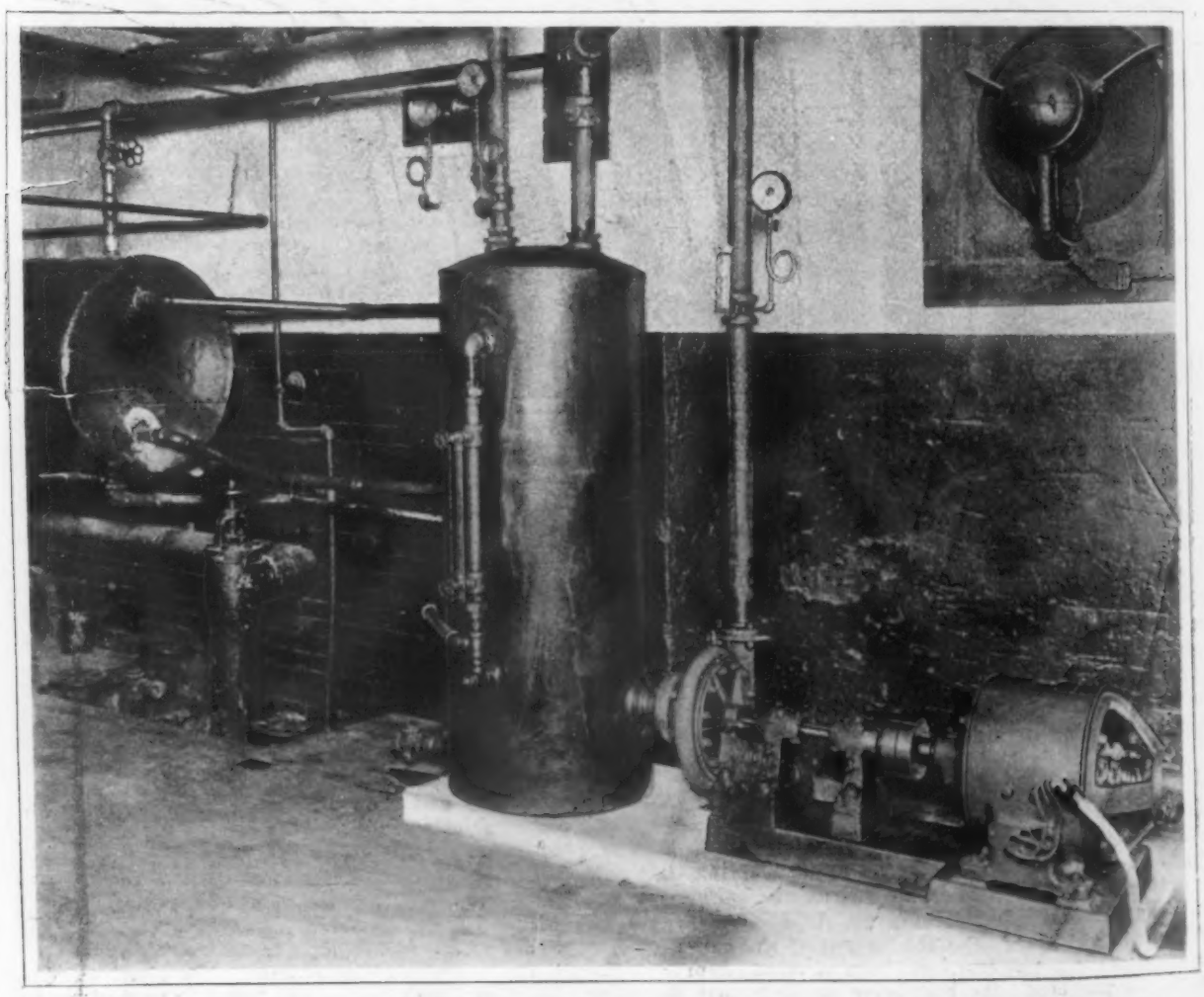
A process of steam generation looking toward the utilization of the heat now lost through the cylinder walls of an internal combustion engine into the water jacket has been developed by J. B. Meriam, Bruce-Macbeth Engine Company, Cleveland, Ohio. The process makes use of a closed circulating system together with a centrifugal pump. The function of the latter is to force the water over the engine cylinder walls at a high velocity and thus prevent even temporary adherence of bubbles similar to those that are formed on the inner surface of the ordinary household tea kettle. This formation of bubbles clinging to the cylinder jacket of the internal combustion engine tends materially to interfere with the flow of heat and thus the cooling effect of the water.

A series of experiments and tests were made on a 150-hp. engine of the four-cylinder type. A centrifugal pump was used to force the water through the cylinder jackets from which it passed into an inclosed tank which was connected to the suction side of the pump. The velocity of the water was from five to ten times that ordinarily used. It was found that a pressure of 10 lb. could be secured on the system in less than 30 min., and later on the pressure increased to 50 lb.

It is stated that with a well-designed exhaust gas boiler, it is possible to recover some of the heat of the fuel lost to the exhaust, so that approximately half of the total number of B.t.u. of the fuel will be available in the form of low-pressure steam. The exhaust boiler or any low-pressure or heating boiler located close to the engine can be included as part of the system. The engine on which the tests were conducted was equipped with a water jacketed exhaust manifold, but without a specially designed exhaust gas boiler and it was found that the temperature of the exhaust gases leaving the engine



An Experimental Outfit for the Generation of Steam from the Jacket Water of a Gas Engine



The Apparatus Installed in a Building for Heating the Hot Water Supply

beyond the manifold exceeded 950 deg. F. at full load.

With the engine operating at full load it is calculated that approximately 4 lb. of water will be evaporated into steam at 25-lb. pressure for each brake horsepower hour delivered by the engine and the quantity of steam generated per brake horsepower will increase as the load decreases. This is due to the fact that the engine under these conditions has a lower thermal efficiency and the fuel consumption per brake horsepower hour is greater. In the tests that were made it was found that at one-quarter load the evaporation was 7.3 lb. of water per brake horsepower hour.

The steam produced by this method is available not only for heating buildings during the colder months of the year but for industrial service where a special boiler or supply of steam would otherwise be required. The system has been installed in the Younglove Building, Cleveland, where there are three gas engines of 30, 60 and 150 hp. with one motor-driven centrifugal pump to supply the high velocity water to any or all the engines and a single expansion tank. The horizontal tank shown is used for heating the hot water supply for the building, and is fitted with a steam coil. This coil receives its supply from the vertical process tank or from a low pressure heating boiler in the next room. This arrangement enables the hot water tank to be carried at full city pressure while the jackets of the gas engines are subjected to pressures of from 5 to 10 lb. only. The bottom of the process tank is connected with the bottom of the heating boiler in the adjacent room by a 1¼-in. pipe, the water level remaining the same in both.

New Feature in Coal Handling from Car to Ship

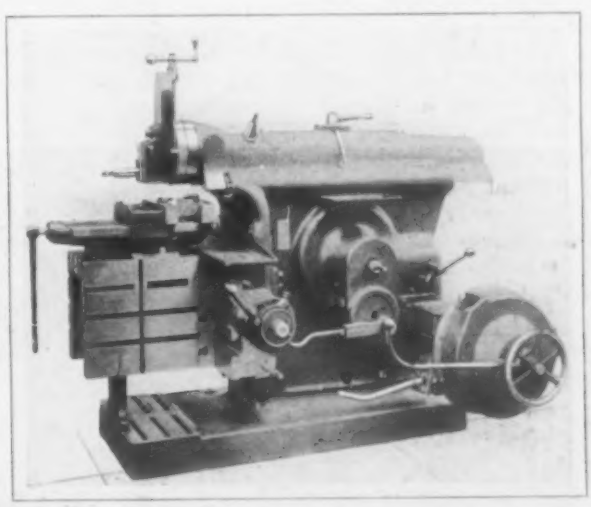
In the new coal-handling plant that will be built for the Southern Railway Company's terminal at Charleston, S. C., there will be incorporated in the arrangement a novel feature for putting coal aboard ships after it is taken from the railroad cars by the car dumper. Mention was previously made of the fact that the contract for this plant has been placed with the Wellman-Seaver-Morgan Company, Cleveland, Ohio. The dumper itself will be of the Hulett type similar to that installed at the recently constructed coal-handling plant at Norfolk, Va., except that it will be mounted on wheels and will be moved by power along the dock with a coal-loading tower. This tower will provide means for loading coal directly from the car dumper to a ship without the necessity of elevating the coal to the top of a stationary coal pier, as has generally been the custom. In other words, machinery will take the place of gravity loading. It is expected that with this plant the same speed can be maintained as with the gravity loading system and that the coal will be handled much more directly and the breakage thereby will be reduced to a minimum. The handling of fragile coal in carload lots without breakage is a very desirable feature of a coal-handling plant.

An interesting example of the amount of slack that it is possible to have in a belt where the Cling-Surface treatment has been employed is presented by a 5-in. single leather belt in the engine room of the Lambeth public baths, Kennington road, London, S. E., England. This belt transmits power from a 15-in. pulley to one 33 in. in diameter and the distance between the shaft centers is 5 ft. The speed of the driving pulley is 500 r.p.m. Power for driving two 36-in. towel washing machines, one 36-in. fan, one 36-in. roller mangle and one 38-in. hydro-extractor is transmitted by the belt. Belt tension is reduced to such an extent that due to the weight of the belt the contact areas of the pulleys have been increased approximately 25 per cent., the belt being so slack that the two portions almost touch in the center.

Shaping Machine with Pulley Guard

The use of a constant-speed single pulley drive instead of the four-speed cone pulley type has enabled Gould & Eberhardt, Newark, N. J., to guard the driving pulley and clutch on a recently developed shaping machine. Both are completely inclosed with the result it is pointed out that it is impossible for the operator of the machine to be injured. The guard can be set in any required position to suit the angle of the driving belt and can also be conveniently removed when necessary. In connection with this constant-speed pulley a gear box of the selective type is employed.

The pulley has an improved form of clutch and brake, controlled by a lever placed so that the operator can stop the machine at any point of the stroke without it being necessary to stop the driving belt. The gear box is of the selective automobile transmission type and the gears are easily shifted while the machine is running as a general



A Shaping Machine Equipped with a Completely Guarded Single-Pulley Drive and a Selective Type Gear Box

thing, although it is recommended that in shifting from the slowest to the fastest speed that the machine be stopped for a moment before the gear corresponding to the highest speed is thrown in. The changes are made by shifting the bottom lever which, as will be noticed from the accompanying illustration, can be located in four positions to give any one of the four speed changes, the arrangement being such that it is practically impossible to engage two speeds at the same time. The gears in the box are made of hardened vanadium steel with cut teeth and run in oil. With a direct drive on a 28-in. machine the speeds obtained from the gear box are 39.9, 58.1, 82.1 and 115.3 strokes per min. The back gears enable four additional speeds of 9.35, 13.22, 19.24 and 27 strokes per min., to be secured. The small lever above the gear box at the extreme right of the engraving controls the engagement of the back gears and the handwheel on the pulley shaft provides a means for adjusting the drive to engage the back gears when the machine is not in motion.

The Western Reserve Steel Company, Warren, Ohio, has completed the erection of the building for its new sheet mills and expects to have the plant ready for operation about January 1. The plant will consist of six mills, foundations being provided for the installation of two additional mills. The plant will be electrically operated, the power being furnished by a commercial company.

House Organ Conducted for Shop Employees

Restaurant for Workmen, Co-operative Store, and Other Means to Promote Efficiency and Loyalty in Hydraulic Pressed Steel Company Plant

House organs conducted in the interests of the selling department of a manufacturing industry are very common. Other publications of this type are in the nature of newsy pamphlets that contain information of general interest about the various departments of the plant and the activity of the company in its various fields, these publications appealing almost wholly to the interests of the executive heads, sales department and office employees and not reaching men in the shops, except possibly the heads of the departments. A house organ that is entirely different is being published by the Hydraulic Pressed Steel Company, Cleveland, Ohio. This is issued for and in the interest of the workmen in the plant to whom it directly appeals.

The publication, which is known as the Hydraulic Press, is gotten out monthly in connection with welfare work of the company and is an eight-page paper 9 x 12 in. in size, well printed on heavy stock and containing quite a number of illustrations. It might possibly be more rightly called a shop paper than a house organ. It is designed to cultivate a spirit of loyalty to the organization among the employees, to make them better acquainted, to make them more interested in their work, to make them better and more efficient workmen and to uplift them in various ways. It aims to bring the management in close touch with the men and to show the latter that their employers are taking a personal interest in their welfare.

Employees May Serve Themselves at Low Cost with Food Prepared by the Company Chef But Use the Tables Whether They Bring Their Own Lunches Wholly, In Part or Not at All

TYPICAL CONTENTS OF THE SHOP PAPER

The general character of the publication is shown by a brief review of some of the features of a recent issue. This contains an editorial article on team work; a signed article by J. H. Foster, vice-president and general manager, asking for letters of criticism or appreciation from the men regarding the 8-hr. day established recently by the company; an article on saving time on piece work; another on the waste in the shop of such supplies as drills, files and oil, and a story involving in a piece of fiction the process of making a brake drum, starting with the mining of ore. An announcement is made that a column will be run under the captain "The Safety Valve," in which employees are asked to criticise anything around the factory to their hearts' content. The foreman or official directly concerned will reply in the same issue, either explaining what was not understood or expressing thanks for the suggestion and telling what will be done about it. The writer must give his name or clock number, but his identity will be concealed by the editor.

Another department of the paper is a page devoted to suggestions made by employees and prize awards for meritorious suggestions. Workmen are invited to make suggestions which are considered by a suggestion committee, and prizes of $2 or $3 each are awarded for the best suggestion. The suggestions are printed in brief and in the one issue referred to there were printed nearly fifty of these suggestions with comments thereon by the suggestion committee. Awards were given for nine of these suggestions. In connection with the publication of the suggestions, it was announced that those

suggestions winning prizes would be carried out in the plant. In the case of other suggestions the paper stated that the proposed changes would be further investigated, had already been ordered made or reasons were given as to why the suggestions were not practical.

The remainder of the paper is taken up with articles of a lighter vein and items of a personal nature such as a story about a baby contest among shop employees with a cartoon of the judges, a half-tone picture of some of the shop employees who are active in sports and a few shop photographs. A want advertisement department is conducted for the benefit of the employees, this being designed to give workmen an opportunity to advertise free of charge articles they have for sale or exchange, such as tools and furniture and for advertisements of employees who wish to purchase such second-hand articles. Various heads of departments make frequent contributions to the paper. Every shop employee is furnished with a copy of the paper free of charge and the men take a great deal of interest in it. A large number of the employees are of foreign birth and some of these who cannot read English have their children read the paper to them at their homes.

SELF-SERVICE HOT LUNCHES

In connection with its welfare work the company has recently established a factory self-serve lunch room, which is in charge of a capable chef. The lunch room was established to improve the physical efficiency of the workmen. With good, wholesome food for lunch the men are found better fitted to do their work in the afternoon than if they depend on a cold lunch brought from home, and they are kept away, in the noon hour, from the neighboring saloon. At first a regular meal was served, but later this was changed to an a-la-carte service. The staple bill of fare includes soup, one kind of meat and sometimes two, two vegetables and potatoes, coffee and milk, dessert and bread and butter. Fresh fruit is provided in season. The restaurant charges are for meat, potatoes and gravy, 9 cents; vegetables, 2 cents; coffee or milk, 3 cents; pie, 3 cents; two slices of bread and butter, 1 cent.

At the present time only about 20 per cent. of the employees patronize the lunch room. Many of the foreign workmen are not inclined to spend their money in buying food in the restaurant when they can bring it from home, but the number that eat in the restaurant is growing. Plenty of wholesome food is provided at a low cost. Men who carry their lunches are allowed to use the tables in the lunch room and can supplement their cold lunches brought from home with anything else they see fit. The average cost of meals in the lunch room is about 17 cents. The men pay for these meals with coupons from books which they purchase, and the books contain $3 worth of coupons. The restaurant is conveniently arranged so that the whole line of workmen may be served in 6½ min. At present it costs the company $40 to $50 per month above receipts to operate the restaurant, but this amount is regarded as well expended, because of increased efficiency.

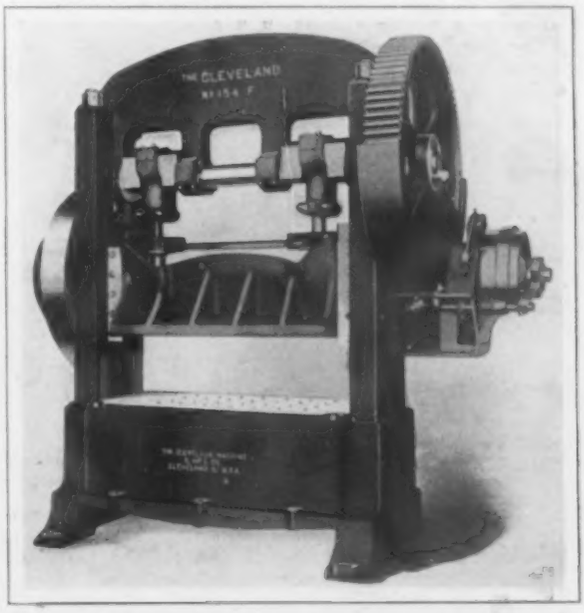
A CO-OPERATIVE STORE FOR CANNED FOODS

In connection with the restaurant the company maintains a co-operative store from which it sells to employees at cost canned vegetables, coffee, eggs and other food products. As the company buys these in quantities, it is able to sell them at a great deal less than the regular retail price. In the case of some of the goods the price is but slightly more than one-half the regular retail price.

A plant library is conducted by the company for the benefit of its employees. In addition to the circulation of books, magazines are contributed by the office employees. These are not returned, employees who take them being allowed to keep them.

Massive Press of the Double-Crank Type

The Cleveland Machine & Mfg. Company, Cleveland, Ohio, has placed a line of heavy pattern double crank power presses on the market. Several sizes



A Recent Double Crank Press of Heavy Construction Weighing 35,000 Lb.

have been developed and each size is made with various widths between the housings, this dimension in the one illustrated being 72 in.

The frame is of the four-piece type, the members being held together by heavy steel tie rods. A variable die space with a maximum of 72 in. between the bed and the slide can be supplied to suit the requirements of individual cases by changing the length of the housings. A special connection is furnished for use with high dies, requiring extreme dimensions. The slide, it is pointed out, can thus be adjusted through the whole die space and the necessity of using auxiliary bedplates, ring bolsters, etc., for dies of normal sheet hight is thus eliminated. Extensions are provided for the slide ways to prevent the slide from overhanging its bearings.

A multiple-disk friction clutch is included in the equipment of the machine. The operating links are fully inclosed to prevent the exposure of any revolving parts. The adjustment is universal on all levers and the brake arms are operated by a pair of toggle links. A hand lever placed in a convenient location for the operator controls the clutch.

The press illustrated measures 72 in. between housings, has an 8-in. stroke of slide and weighs approximately 35,000 lb.

A forge shop fan with both the blast and exhaust fans mounted on the same shaft has been installed in the forge shop of the Toronto Railway Company, Toronto, Ont. It supplies the air blast for a number of small forges and the blast duct is located beneath the floor, as is also the case with exhaust piping from the forges to the exhaust fan. Aside from the mounting of both fans on the same shaft, the design is similar to the standard sets of the builder, the B. F. Sturtevant Company, Hyde Park, Boston.

Gardens Furnished Steel Plant Workers

Experiment of American Steel & Wire Company in Cleveland Allowing Employees to Cultivate Unused Tract Proves Highly Successful

Putting vacant land adjoining manufacturing plants to work for the benefit of employees is a new field of activity in the line of welfare work that has so far been given little attention by plant managers, but which is beginning to attract considerable interest, particularly among companies owning tracts of land of considerable size in the vicinity of their plants which may not be used for building sites for manufacturing or other purposes for many years. In *The Iron Age* of August 20 there appeared an article relating to the experiment of the Norton Company, Worcester, Mass., in allotting unused land to its employees for gardens. At the time the Norton experiment was launched last spring a plan very similar in its details was adopted by the American Steel & Wire Company to provide garden space for the employees of its Cuyahoga works in Cleveland and its Donora steel works and Donora wire mills, Donora, Pa.

Adjoining the Cuyahoga works are 20 acres of unused land, and early last spring R. W. Ney, general manager of the wire mills of the Cleveland district, conceived the idea of turning this ground over to the workmen as garden sites on which vegetables might be raised at the same time affording healthy and profitable recreation. The land set aside for garden purposes consisted of two plots, one of slightly over 4 acres divided into 24 lots 67 x 73 ft.; 8 lots, 40 x 115 ft. in size, and 5 lots, 80 x 65 ft. in size. The other plot covering 5½ acres was divided into 58 lots 50 x 85 ft. in size, making 95 plots in all. The shape of the plots made it impracticable to divide the land into gardens of uniform dimensions. The land was plowed

Employees' Vegetable Gardens Cared for Before and After Working Hours and at Noon Time; at Upper Left What Is Known as the Harvard Garden Plot on June 20 and at the Upper Right the Office Plot on June 24

by the company, harrowed and gotten into good shape for gardening purposes before being allotted and was then staked out by the company's engineering department, which placed a number on each plot for identification.

PLOWED BY COMPANY AND DISTRIBUTED BY LOT

Employees of the Cuyahoga works and pensioners from this plant, the Newburgh works and the Central furnaces, as well as some of the employees of the Newburgh & South Shore Railroad were given the privilege of cultivating the garden plots. Plots were not drawn by lot, but were assigned as requests for them were made. No regulations were provided for the cultivation of the land, but the men were instructed to work it to the best advantage and were given to understand that those who were negligent in this respect would be refused a garden plot next year. Management of the gardens was placed in the charge of a committee headed by the superintendent, the other members of the committee being the assistant superintendent, chief clerk, chief time keeper and two foremen. The company offered prizes aggregating $60 for the best gardens, the management committee acting as judges. The gardens as a whole were entered in a home gardening contest conducted by a local newspaper.

All the men took a great deal of interest in the work and some purchased fertilizers to enrich the soil. The work of cultivating the gardens was done mostly before and after working hours and in the noon hour. Generally the men were well repaid with the crops they secured. While some of these crops were not as large as they should have been, this was due for the most part to weather conditions and not to any lack of attention on the part of the gardeners. Some of the gardens were declared to be very fine both from the standpoint of general appearance and amount of produce raised. The leading crop was potatoes, but a considerable portion of the gardens was devoted to tomatoes, beans, sweet corn, beets and other vegetables. The company provided a waiting room with seats on the grounds, where the gardeners, their wives and children could rest and seek shelter in bad weather.

MORE GARDENS NEXT YEAR

The company is thoroughly satisfied with the success of the experiment and will provide additional gardens next year, increasing the number of plots to 125 or more. It will also secure advice from the State agricultural department as to the kind of fertilizers needed for the soil, and to insure good seed it will buy seed in bulk and sell it to the men at cost. Instructions in gardening or literature on the subject will also probably be provided. It is the intention to place some man who is an experienced gardener in direct charge. In view of the fact that the experiment has proved so successful additional gardens will probably be provided next year at other plants of the company where land is available for that purpose.

The first shipment of generators for the Ford Motor Company's new power plant at Detroit left the works of the Crocker-Wheeler Company, Ampere, N. J., last week. It will require about 15 cars to transport the material for the four units, each having a normal capacity of 3750 kw. and weighing 105 tons. The field coil of each machine with coils assembled is 21 ft. high and 26 ft. wide across the supporting feet. The armature is approximately 16 ft. in diameter and weighs about 87,000 lb. As these dimensions exceed the limits set by railroads for clearances on tracks, bridges and tunnels, the assembly of the armature parts and winding will be done in Detroit.

RECORDING TELEPHONE TALKS

Edison Invention by Which Telephone Intercourse Is Preserved on the Phonograph

A simple means has been perfected of arranging for a phonographic record of a telephone conversation. A little desk instrument is used by means of which one of the parties to the telephone talk

Thomas A. Edison in the act of telephoning and having the conversation recorded on a phonograph. He has placed the receiver of the desk telephone in the socket of the telescribe, so called, while he holds to his ear a receiver belonging to the telescribe.

may place as much of what occurs in the conversation on a phonograph record as he desires. It is the invention of Thomas A. Edison and is known as the telescribe. An idea of the telescribe and the possibilities of its use may be gained from the accompanying illustration.

A telephone message is recorded in the following manner: The receiver of the regular desk-telephone is removed from the hook and placed in the socket of the telescribe. In this way the acoustic connection to the dictating machine, it is claimed, is made without danger of criticism from the telephone company, as the instrument is neither mechanically nor electrically connected to their lines. The user then takes up a small receiver, which is part of the telescribe, and gives his call to the exchange, while starting and stopping the dictating machine by means of two small buttons on the telescribe in order to record the conversation between pauses or delays, thus avoiding any waste of running the wax cylinder meanwhile. Both sides of the telephone conversation are recorded, including all evidence of the central operator's voice in making connection.

The telescribe, it is believed, will place the use of the telephone in a more serious light in business. After a conversation, the dictator will turn to his dictating machine and confirm his message in the usual manner covering the general understanding. To the person receiving this confirmation, the question of its correctness will be unquestioned. The wax records may, it is explained, be retained indefinitely for reference.

FOUR-WAY DRILLING MACHINE

Built for the Ford Motor Company by the Reed-Prentice Company

The special four-way drilling machine shown in the illustration was built for the Ford Motor Company, Detroit, Mich., by the Reed-Prentice Company, Worcester, Mass., for drilling four holes simultaneously in universal joint rings. The rings, 3⅛ in. in diameter, are held in individual fixtures, several of which are provided, so that while one ring is being drilled another fixture is loaded, ready to take its place in the main fixture of the machine. The design is simple.

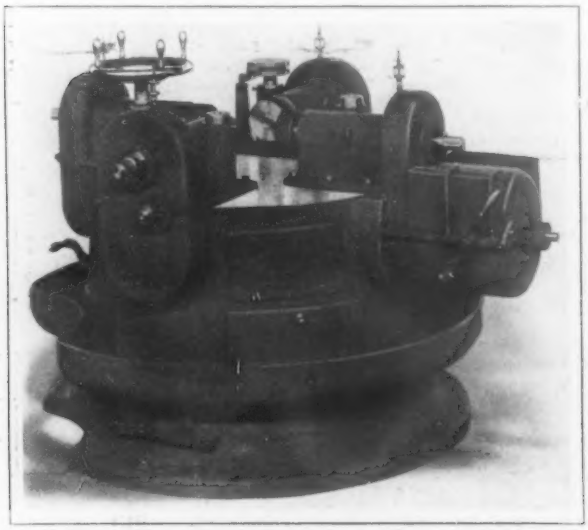


Fig. 1—The Four-Way Drilling Machine Built by the Reed-Prentice Company for the Ford Motor Company for Drilling Universal Joint Rings

The drive is from a main pulley on one side of the machine, power being delivered to each of the four spindles through spur gears, shafting and bevel gears. The heads are securely held to the base to maintain as closely as possible absolute alignment and resulting accuracy of right angles of the holes in relation to one another. The feed mechanism is of the rack and pinion type, power being delivered to each of the spindles by a large bronze worm gear and hardened steel worm. To start the feed, a lever at the operator's left hand engages the worm and its gear. When the spindles have traveled their required distance an automatic knock-off cam at the top of one of the rack pinions compresses the rod and automatically trips the feed mechanism. The spindles are then returned to their starting positions by the operator by means of the handwheel shown on the head at his left hand.

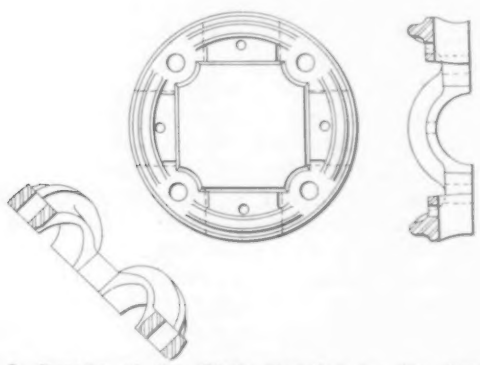


Fig. 2—Details of the Work Handled by the Four-Way Drilling Machine

The driving gears of the machine are all of the helical type and all bearings are bushed with phosphor bronze. Wherever possible the shafts are double-supported. The lubrication is taken care of by means of a pump and piping leading to each individual bearing, this splash system providing a continuous cleaning out of the bearings. The machine is 6 ft. 6 in. by 5 ft. 6 in., and 4 ft. 6 in. high. The weight is about 7000 lb.

Effect of Steam on Magnesite

Users of magnesite in open-hearth steel furnaces, electric furnaces and copper converters, reverberatories and settlers are interested in the fact that magnesite, whether in calcined form or the most thoroughly burned brick, will hydrate as calcined lime does when water is added. R. H. Youngman, assistant to the president of the Harbison-Walker Refractories Company, in discussing this effect and tests that were made for the purpose of measuring it, says that "the effect of the hydration is disintegration to an almost impalpable powder. It does not seem to bear any relation to the content of lime or other impurities, as the tests showed the same results for the Austro-Hungarian as for the white or very pure Grecian magnesite." The former contains 87 per cent. magnesia, 7 per cent. iron oxide, 2.50 per cent. lime and 2.75 per cent. silica, as against 93 per cent. magnesia, 1 per cent. iron oxide, 2.25 per cent. lime and 2.50 per cent silica in the latter.

"Tests were conducted by placing brick in a steam-tight cylinder and subjecting it to steam at 100-lb. pressure for a period of two hours. All brick tested showed hydration to the same degree, though it is reasonable to conclude that the action would be somewhat retarded under lower pressure or less severe conditions.

"Difficulties of this nature have been experienced in open-hearth furnace bottoms by laying the brick and magnesite bottom over a bed of refractory materials mixed with water. Upon heating up, steam is formed and the bottom may be very badly damaged by hydration of the magnesite. This fact, which has not been well established until recently, no doubt accounts for a number of similar troubles which have occurred in years past. It also explains cases of disintegration of burned magnesite brick which have been in contact with steam leaking from coils or steam-heated floors used in manufacturing magnesite brick. It should be made a matter of common knowledge so that users of magnesite will be able to guard against trouble of this kind, especially during the initial heating period.

"The impurities in the Austro-Hungarian magnesite render it less refractory and it will frit more readily at operating temperatures, which is a very important property, especially in open-hearth practice in building the bottom and repairing the slag line. In the calcined form, for commercial uses, Austro-Hungarian magnesite has a rich brown color and white magnesite is either white or a very light brown, depending upon the thoroughness of calcination."

Domestic Production of Magnesite

The United States Geological Survey reports a decrease in the output of magnesite in the United States from 10,512 net tons, valued at $84,096, in 1912, to 9632 tons, valued at $77,056, in 1913. The only production in this country was in California, as heretofore. With the cutting off of the foreign supplies, due to the European war, however, the Survey states that the demand for the domestic product ought to increase greatly, especially in view of the new and shorter water route by way of the Panama Canal to the eastern United States. The demand for the domestic product has hitherto been restricted to the Pacific coast and Rocky Mountain region, because of the high railroad freight rates; but in answers to inquiries addressed to them by the Geological Survey, many owners of idle magnesite properties in the far West express the belief that the Panama Canal opens the way to reach Eastern consumers.

TRAINING FOUNDRY LEADERS

Wentworth Institute to Develop Executive Ability as Well as Mechanical Skill

At the annual convention of the American Foundrymen's Association at Chicago, September 8 to 11, E. A. Johnson, of the Wentworth Institute, Boston, delivered an address in which he emphasized the complete dependence of the American foundries upon the successful development of executives with not only mechanical skill but technical ability and the qualities of leadership as well. He outlined a new two-year course in foundry management and operation now offered by Wentworth Institute to fulfill this need. It is intended to train young men exclusively for the advanced positions in the foundry industry which require a combination of these three qualities. The work is divided into seven departments; namely, shop experience; text-book study, reading and recitation; drafting and design; rapid computation as applied to foundry problems; foundry engineering; applied chemistry, physics and metallurgy; and, finally, the development of initiative and leadership.

Three-eighths of the entire time is given over to gaining experience in shop practice in bench and floor molding of patterns in great variety; experience with different kinds of molding sand and different kinds of facing; also open sand work, sweep molds, dry sand work, and instruction in machine molding; setting of cores, use of risers, and methods of gating and venting for unusual and difficult types of patterns. The course also includes instruction in architectural iron work, stove plate work, brass and aluminum casting, and the use of other alloys. There is also given instruction in core-making by hand and by machines; in pickling and other methods of commercially cleaning and finishing castings, and in lining, charging and managing the cupola. The shop instruction of the second year includes advanced work in practically all the lines included in the first year. More difficult and complicated types of work are undertaken and more time is devoted to dry sand molding, sweep molding and heavy work handled with the traveling crane. Instruction is given in making matchboards and mounting patterns on molding machines for rapid reproduction.

In addition to the productive work in the shop, the student is placed in charge of certain departments of the shop at certain periods and is held responsible for the production. In this way he is given an opportunity to gain experience in laying out work and handling men. By carefully economizing the men's time it is confidently believed that in two years much more practical skill and experience can be given than young men would get in a commercial shop in a four or five-year apprenticeship. Experience at the institute has proven that this is really a very conservative estimate. If they have already had a considerable amount of practical experience—as is desirable—then this practical training, added to what they already have, will be of an advanced character and will enable them to take up grades of work that would come entirely outside the range of the ordinary experience.

Technical knowledge which will enable the student to organize the work in the shop, ability to judge how jobs should be handled and how economies may be effected, and how in a thousand and one other ways to bring accurate, detailed, technical knowledge to bear upon every department of the business is accomplished by text-book study, reading and recitations, practical talks and lectures, which are continued throughout the two years' course.

The third important subdivision of the work includes a variety of training given on blue-print reading and design of foundry equipment. There are many problems that can be solved better with drawings than in any other way, and a skilled foundry leader, if he is to get the best results, must have facility with his lead pencil and ability to express his ideas on paper, to sketch the things that he wants done, and to design the details of foundry appliances and foundry equipment. Provisions have been made for a thorough training along this line.

Foundry Students Carrying Out Dry Sand Molding Under the Direction of One of Their Fellows

Rapid and accurate computations of a great many kinds enter into the foundry business. These include not only estimating of cost and quantities of material but also a great variety of practical computations, involving the use of formulas and more or less advanced mathematics. A systematic course of instruction is therefore planned involving computations of just this kind, including such branches of mathematics as are essential. Care, however, is taken to omit text-book subjects that do not find daily application in the foundry.

The fifth principal subdivision of the instruction is planned to cover all those principles of applied science which enter into the foundry industry and those general principles of engineering such as steam generation, power transmission, application of electricity and compressed air, strength and stiffness of materials, etc., which every foundry manager must understand if he is to become a leader of the forward type. The specialists who planned the course regard this feature of it as extremely important and are giving a considerable amount of time to it. A special laboratory has been equipped for just this kind of work. Through lecture and recitation and through innumerable experiments in the laboratory the students are to be drilled in these departments of applied science.

Perhaps the most original part of the work, so far as school practice is concerned, is the instruc-

tion that has been planned in foundry chemistry and chemical and metallurgical engineering, including, of course, the questions of combustion and the effects of temperature. The importance and value of this part of the work alone cannot be overemphasized. Already two laboratories are especially devoted to it.

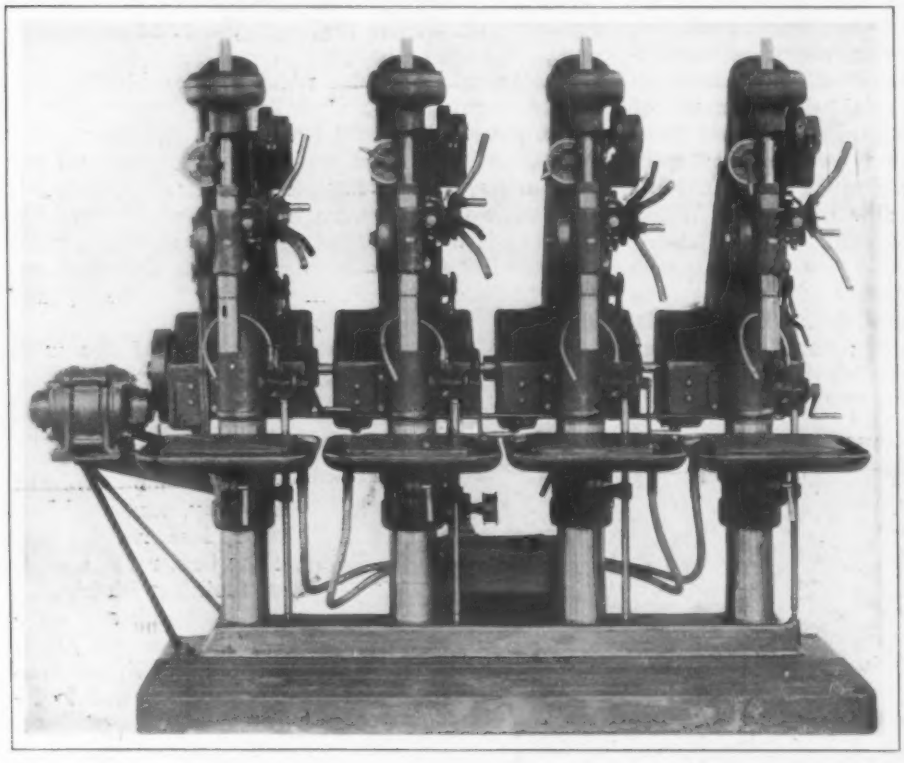
The type of man for whom the course is planned has been referred to as "The Leader." Leadership is a quality the course aims above all else to develop. It can be developed, like any other quality, through practice, and therefore it has been definitely planned to give the students in the course ample opportunity to obtain systematic experience both in planning work and in directing the work of others. They will be expected to act as foremen, supervising at first small operations, and as they gain experience assuming larger and larger responsibilities. Experience at the institute in other courses has demonstrated that this kind of foremanship training develops eminently the qualities of initiative, resourcefulness, courage and self-confidence, which taken together are called leadership. Therefore it is planned to give in this course in foundry management and operation a considerable amount of attention to this all-important feature upon which so much depends.

The new shops of the Chicago & Alton Railroad at Bloomington, Ill., which are to cost $1,000,000, are approaching completion. The locomotive erecting shop will have a capacity of 28 locomotives. The group will also include a blacksmith shop costing $75,000; a store department structure and other buildings. The locomotive shop will cost $550,000 completed.

An exhaust steam turbine for driving a rolling mill was installed in the works of the Carpenter Steel Company, Reading, Pa., in July, this year. It is a 600-hp. De Laval mixed-flow turbine and operates an 18-in. roughing train which delivers bars to 10-in. merchant finishing trains.

New All-Geared Gang Drilling Machine

A four-spindle independent column, 20-in. gang drilling machine has been developed by the Barnes Drill Company, Rockford, Ill. The new machine is an adaptation of four individual 20-in. self-oiling, all geared drilling and tapping machines which were illustrated in *The Iron Age*, June 4, 1914. All of the features and advantages of the earlier machine are said to be preserved in the new tool which is designed for use where quantity production at high speed or a considerable range of speed and a positive drive are required. One of the features of interest of the new machine is the comparatively small amount of power required for driving.



A Recently Developed 20-In. Gang Drilling Machine of the All-Geared Type

As was the case in the earlier machine each spindle has eight changes of geared speeds and the same number of feed changes, all of which are under the immediate control of the operator from the front of the machine, while all of the spindles may be operated independently of each other. An automatic reversing mechanism is provided which enables the operator to give almost his entire attention to the setting and removal of the work with the result, it is pointed out, that production of the machine is kept up to its capacity. The general specifications of this gang machine are identical with those of the single-spindle tool which was illustrated in the earlier issue.

The economy of power which is made possible by the use of this machine as compared with the same number of single-spindle machines is a factor to be taken into consideration. A single-spindle machine of this size is driven by a 2-hp. motor, while only a 5-hp. unit is required to drive the four spindles operating as a gang drill. The total weight of the machine is about 5000 lb.

Test of a Circular Saw of High-Speed Steel

The performance of a high-speed steel circular saw, as observed by a large user of circular saws, has been brought to the attention of *The Iron Age*. It was a 16-in. saw of 3/16-in. material with 126 teeth, made by E. C. Atkins & Co., Indianapolis, and the test covers a period from November 1, 1913 to July 1, 1914. The following table covers the data and results:

Speed of saw, r.p.m.	8
Average peripheral speed, ft. per min.	32.46
Feed, in. per min.	0.125
Duration of run, hr.	675.5
Carbon steel cut, sq. in.	3,424.48
High-speed steel cut, sq. in.	9,672.06
Total steel cut, sq. in.	13,096.54
Number of times ground	8
Number of sq. in. per grinding, average	1,637.06

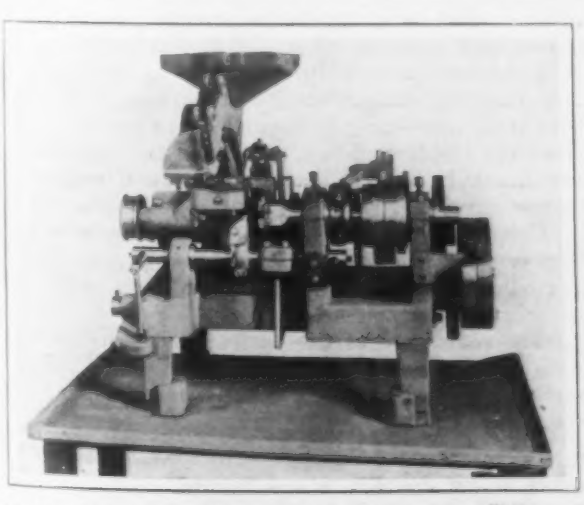
The Deforest Sheet & Tin Plate Company, Niles, Ohio, has recently enlarged its sheet-steel stamping department and installed a new 300-ton press. In this department the company makes automobile and other stampings and is now equipped to make stampings up to ¼ in. in thickness and up to ½ in. in small work.

Automatic Hopper Feed Screw Machines

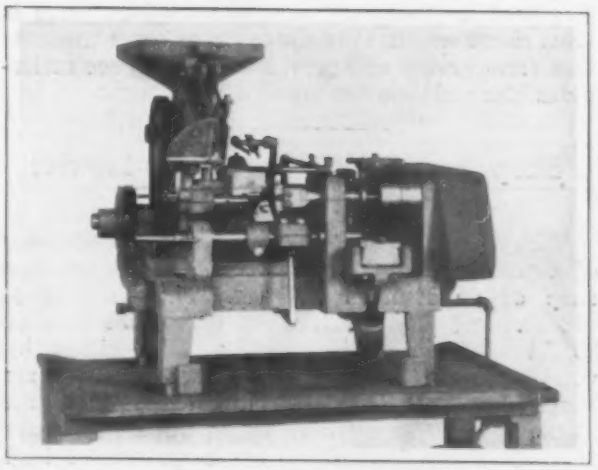
A line of machines for manufacturing the common gimlet point wood screws and performing similar operations on headed blanks has been developed by the H. P. Townsend Mfg. Company, Hartford, Conn. These machines include a heading machine, one for shaving and slotting the heads and another for pointing and threading which can also be used for plain turning and plain threading. The last can also be furnished with a drilling attachment that can be used separately or in combination with the other attachments with which the machine is supplied.

After the blanks have been made in a heading machine they are taken to the shaving and slotting machine. This machine has a single spindle which revolves for the turning or shaving of the head and stops automatically when this operation is completed. The spindle is locked in position while the sawing operation takes place and starts again so that the turning tool can remove the burr left by the saw. One of the features of the machine is that it has a tool bar adapted to rock the tool against the work for an ordinary turning operation. This tool bar, together with its operating levers, forms what is known as the turning mechanism and can be used in connection with the saw mechanism or independently of it. It is also possible to use the sawing mechanism independently of the turning one so that the machine can be used as a shaving and slotting machine or for plain shaving or for plain slotting. One of the special features of the saw mechanism is an arrangement for compensating for irregularities in the saw by which the saw cuts all the way around instead of just on the high teeth. In this way it is pointed out that three or four revolutions of the saw will perform as much work as a greater number will in other devices. Breakage of saws is also prevented to a great extent by this arrangement, as a tooth which catches or clogs can relieve itself before it will break.

The blanks are taken after being shaved and slotted to the pointing and threading machine in which practically the same turning mechanism is used and the saw mechanism is replaced by a pointing tool. Both the saw mechanism and the pointing tool are mounted on the same bearing and can be interchanged, as the frame, spindles, back rest bracket and feed mechanism are alike in all the machines. The threading tool not only feeds in to secure the depth of cut, but reciprocates longitudinally to cut threads of any desired pitch, passing



The Machine for Shaving and Slotting the Blanks for Wood Screws After They Have Been Formed in the Heading Machine



The Second of the Machines Used, That Employed for Pointing and Threading the Screws

over the screw as many times as may be required. The turning mechanism is adapted to move sidewise and thus constitutes a threading or turning mechanism, plain turning being done in the same manner as on an ordinary lathe. The tool feeds once across for each complete cycle of the machine when turning is being done instead of several times as is required in threading. The pointing mechanism is independent of that employed for threading so that plain pointing can be done and the threading operation omitted or vice versa. A drilling attachment is also provided which can be applied to the frame without changing the general mechanism. This attachment can be used in combination with the plain turning or threading device or independently of either. A slight change in the spindle and its operating levers converts the drill into a tapping or die threading device, the tapping spindle being started and stopped by levers. This device also can be used independently of the forming mechanism or in conjunction with it as may be desired.

The feed mechanism can be omitted and a rod feed applied to the spindle, thus enabling the machine to be utilized for turning, drilling and cutting off small pins, studs, etc. In the machines mentioned the spindle revolves, but in another application of the saw mechanism for plain slotting this is not the case and it is possible to use two saws on a saw spindle for flatting or slabbing off two sides of a blank. A device can be applied for indexing the spindle 90 deg. so that the saws can be brought up to flatten two sides of the blank and then withdrawn, while the spindle is turned 90 deg. and the saws again brought into action to form a square head on the blank. It is also possible to mill a hexagon shape with this index. The feed mechanism will feed the blanks either point first or head first into the spindle so that all of the operations can be performed on either end of a blank. It is stated that the feed mechanism will feed from 90 to 95 per cent. of the blanks, one notable record being a continuous run of 32 hr. without missing a blank.

A tight and loose pulley on the spindle with a belt shifting device enables the operator to turn the machine by power when trying out the tools. In some of the machines an interlocking belt shifting mechanism is provided so that the machine cannot be started unless the spindle is revolving, thus preventing breakage of the tool. All the adjustments on the machine are directly in front within easy reach of the operator.

The machines can be provided with pans, legs and oil system so that they may be used either

singly or in a battery as desired. The drive is from above which, it is emphasized, keeps the belts free from grease and provides a clear space underneath the machine for storage.

Shop Installation of Cooper-Hewitt Quartz Lamps

The accompanying illustration is a reproduction of a photograph by night of a locomotive erection shop of an Eastern railroad. The building is 528 ft. long and 58 ft. wide, giving an area of 30,624 sq. ft. The illumination is furnished by what is known as type Z Cooper-Hewitt quartz lamps operating in a 220-volt direct current circuit. The lamp uses the mercury vapor, but a short tube of used quartz instead of the long tube of lead glass used in the older types. Twelve lamps are

In this Railroad Shop, 528 Ft. Long and 58 Ft. Wide, a Line of 12 Lamps Are Provided 50 Ft. Above the Floor

installed regularly spaced down the middle of the building at intervals of 44 ft., giving an average space lighted by each lamp of 2552 sq. ft. The lamps are hung at a hight of 50 ft. above the floor. They are rated at 2400 candle power with an energy consumption of 725 watts. The only other form of artificial light required is a portable hand lamp needed when the workman goes inside the boiler.

The total number of lumens per lamp from these units is 14,603, with a total available in a zone of 0 to 60 deg. of 10,800 lumens per lamp which, with a wattage of 725, gives a value of 20.2 total lumens per watt, and 14.9 available lumens per watt. The wattage consumption per square foot is no more than 0.28 for the erecting shop. The average number of candle feet is 4.24. The maintenance charges for 16 months total $134.54, or $4.58 per lamp per year, according to the Westinghouse Electric & Mfg. Company.

The soft metal rivet factory of Elmer E. Peck, Batavia, N. Y., was destroyed by fire September 26.

Green Sand Cores

At the meeting of the American Foundrymen's Association, Chicago, September 10, a paper on green sand cores was read by James Mulvey, Rensselaer Valve Company, Troy, N. Y. The following notes have been taken from it:

There are many concerns who are at present making castings of light weight, and some that weigh 800 lb. each with green sand cores. The castings are of various shapes and sizes, and include tees, pipe fittings or in fact most any kind of work that is standard.

Green sand cores are always ready for the molder.

There is little mixing of sand and no baking. The caving in, shaking out the cores and other economies over the dry sand method will cover the cost of rigging. The sand is used from the molders' floors, and the small amount of facing that is used will keep the molding sand in the proper condition. The sand should be selected according to the weight of the casting. A fine grade should be used for small work up to 10 lb. in weight, and No. 3 or No. 4 open sand for work up to 800 lb. The sand used for the various work can be taken from the molders' floors, as a sand that is suitable for the outside of a casting, you will find, with proper care, will be equally suitable for the inside.

Great care should be taken in venting the cores. The vents should be large and kept open to let the gas off freely; this will prevent cutting and other troubles.

The shrinkage of the castings is more uniform with green sand than with dry sand cores, and one can depend on castings coming almost true to the required size.

VALUABLE FOR BRASS WORK

Green sand cores are valuable in casting yellow brass, the common red metal, or in fact any of the bronzes of the 88-10-2 class, as the dangers of por-

ous castings are greatly reduced. The cores should be built up on arbors and if the shape of the castings permit the parts of the arbor must be built with a tongue and groove and dovetailed together. The tongue and groove can be cast on the arbor without any machining and should be made so they will drop in without driving; they should also be snug enough so they are not loose. You will find that the up-keep of the arbors is very small.

In casting the arbors, the pattern should be made with lifting holes or handles so one can lift the small cores from the core box; but the large cores that are too heavy to handle by hand should be provided with trunnions so they can be handled by the crane.

The large cores that are handled with a crane should be made on a drop machine or table, so the core box can be drawn away from the core. This is a much better method than drawing the core from the box and will insure better and almost perfect cores. Some core boxes can be made with hinged joints and the arbor should be made to fit the drag half of the box which carries the sand; the cope half is flopped over on the drag and then rolled back in the same position and the core removed.

In cleaning the castings made with green sand cores, there should be no hand work. The cleaning can be done either with a sand blast or with tumbling mills. The saving here alone is noteworthy. Practically no chipping is necessary as the cores can be made very close without danger of crushing, and there are no large fins such as one gets with dry sand. The pasting is entirely eliminated.

Greenawalt Iron-Ore Sintering Plants

A number of contracts have been made this year for the installation of iron-ore sintering plants using the Greenawalt process, which is controlled by the American Grondal Company. The following companies have made or are now completing Grondal installations:

Pennsylvania Steel Company, Steelton, Pa.
Maryland Steel Company, Sparrows Point, Md.
United Iron & Steel Company, Leetonia, Ohio.
Northwestern Iron Company, Mayville, Wis.
Sintered Ore Company, Buffalo.
Wisconsin Steel Company, Chicago.
National Tube Company, Lorain, Ohio.
Pittsburgh Steel Company, Monessen, Pa.
Lake Superior Corporation, Sault Ste Marie, Ont.
Detroit Iron & Steel Company, Detroit.
General Chemical Company, Chicago.

The Buffalo plant has five units and that at Sparrows Point, four units, while the others have either one or two units. In most cases the material sintered is flue dust. Some of the plants work on a mixture of flue dust and ore, while in other cases pyrite residue or sulphurous iron ores are sintered. Several other plants are now under negotiation.

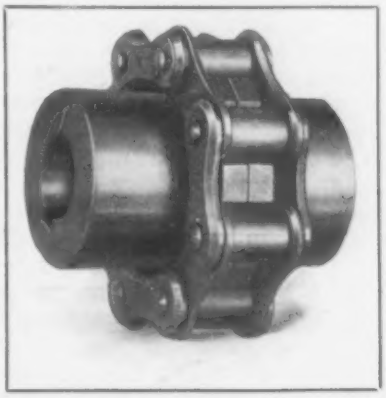
Among foreign installations of the Greenawalt process are two in Italy, of which one belongs to the Elba Company, using fine brown ores mined on the island of Elba. There is also a Greenawalt plant in Japan. Norway and Sweden each have one, both of these operating on magnetic concentrates.

All the stock has been subscribed for the new company that will take over the sheet-steel mill of the National Rolling Mill Company, Mansfield, Ohio, and it is stated that the plant will be placed in operation about December 1. In addition to a 240-ft. extension to the building an 1850-hp. double jackshaft mill engine will be installed.

The Kelly Reamer Company, Cleveland, Ohio, reports the opening up of a demand for its products from England. At the time the war broke out the company had on its books a number of orders from that country which were held up. These orders have been released and some new business is now coming out.

A Quickly Attachable Flexible Coupling

The Clark Flexible Coupling Company, 90 West street, New York, has introduced a flexible coupling which consists of two sprocket-cut hubs held flexibly together by a roller chain which allows an adjustment of the teeth to all positions of alignment. The roller bearings of the chain are in contact with all the teeth at one time, which fact is regarded as guaranteeing an equal distribution of the load and minimum of wear. After the hubs are attached, the connection is quickly effected by wrapping the sprockets with the chain and clasping the ends together by a master link. In case it is desired not to use all a shop equipment, for example, part of the machines in the shop may be disconnected by merely unwrapping the chain at the proper coupling, leaving sections of the shafting idle. The coupling is furnished in sizes for shafting from ¼ in. in diameter to 27⅜ in. in diameter and is designed to have greater strength than the shafting itself.



A Coupling of Sprocket-cut Hubs Held Flexibly Together by a Roller Chain, Which Can Be Quickly Connected by Wrapping the Sprockets with the Chain and Clasping a Master Link

By means of a slight variation in the size of the sprocket, the amount of play in the coupling is varied to meet the requirement of each individual installation. In cases where flexibility but no play is demanded, the chain is made to fit the sprocket tightly. A special type, with fiber sprockets, is supplied for use on electrical equipment, especially the direct-connected type. For high-speed turbine work it is enclosed and the sprockets run in oil.

Continued Better Car Movement

The fortnightly bulletin of the American Railway Association shows that on September 15 there was a net surplus of idle cars on the lines of the United States and Canada of 136,049, compared with 163,326 on September 1, a decrease of 27,277. The decrease in the preceding fortnight was but 8819. The net surplus as of September 15 this year of 136,049 compares with 40,159 a year ago. In the two weeks the net surplus of box cars decreased from 74,922 to 55,985, and the surplus of coal cars from 46,075 to 39,367. There was an increase in the flat car surplus, the total of 8387 comparing with 7233 September 1. The reduction in the net surplus of box cars reflects the freer movement of grain. This reduction was practically all in states west of the Mississippi and in Canada. The decrease in the surplus of coal cars follows similar reductions in previous weeks and is due to the heavy movement of soft coal since the war broke out, destined to South American and Mediterranean ports.

The American Steel Foundries announces that the contemplated shutdown of the plant at Granite City, Ill., has been averted by the receipt of new orders which enable the foundry to be kept running and that it is likely that the working force will have to be increased shortly.

Steps are being taken to reorganize the Conway Steel Range Company, Bellevue, Ohio. The company's plant was sold some time ago by the receivers.

PRODUCTION AND FATIGUE*

What Should be Done to Discover and Remove Unsatisfactory Conditions

In the campaign for efficiency, too little attention has been given to the subject of fatigue in the industries and its relation to production. We divide fatigue into two classes: Fatigue brought to the work and fatigue acquired while at work. The effect of these two on production may be the same, but their treatment by the management is very different.

Fatigue brought to the work and acquired elsewhere can only be handled by the management indirectly, by some such plan as the home reading box movement [described in *The Iron Age*] which provides for the worker reading matter which may make his non-working hours more restful to him. This movement grew out of a desire to have the literature available to the different members of an organization made more serviceable. It consists of placing a box in the plant, which is filled with magazines, catalogues or any kind of literature with which any member of the organization is finished—this is to be at the disposal of any other member of the organization who may wish to read it or to take it home, to be read there, or to be passed on. By such a plan as this, by co-operation with the public libraries, and by other methods of a like nature, fatigue acquired while away from work may be cut down, with a resulting increase in production and with little or no extra expense in money, time or activity.

LOOKING FOR CASES OF UNNECESSARY FATIGUE

As for the fatigue acquired while at work, this again divides itself into two classes: Necessary fatigue, or that which actually adds to production; and unnecessary fatigue, that is, fatigue which adds not at all to production, but is simply the result of unhealthful, unstandardized or unstudied conditions.

The first step in eliminating this unnecessary fatigue is the recognition of it. For this we recommend a fatigue survey, which is simply a way of saying that every manager should walk through his entire plant at least once with a view to observing two things, that is, what the amount of fatigue generated is and what percentage of it is unnecessary.

We persuade the manager to look for fatigue eliminating devices in his plant. It is not so important that these devices be in actual existence at the start and be recognized and listed, as it is that the manager first, and practically the entire organization later, come to think in terms of unnecessary fatigue and methods by which it may be cut down. If such a survey is conducted seriously and thoroughly, the introduction of fatigue eliminating devices will certainly follow.

FATIGUE ELIMINATING DEVICES SCARCE

We have attacked the problem of arousing interest in this subject in another fashion, also. We have begun the forming of several museums for the exhibition of devices for the elimination of unnecessary fatigue in the industries. The first of these museums, though it has been in existence for over a year, has as yet but half a dozen exhibits; this in spite of the fact that we have sent out literally tens of thousands of requests for such devices, or for photographs of them. The reason that the number of exhibits is so small is not lack of co-operation, but is because of the fact that so few such devices exist to-day. The interest in the subject is sure to grow, during the next year, as all of the members of the second summer school of scientific management held at Providence are beginning museums at their colleges; but such museums can never grow as they should until those actually in the industries become interested in the plan, and begin to think in the vocabulary. And it is the Efficiency Society that should take up this matter, as being of great benefit to the worker and of much profit to the employer.

As a starting point, we would recommend considering the possibilities of supplying workers with chairs. Even such work as heavy filing can be done, as we have demonstrated, just as quickly and with much less fatigue, sitting as standing. We will be glad to supply anyone interested and willing to co-operate in this movement with some photographs showing the simplest and most inexpensive of chairs, designed for workers in the various trades, which have shown themselves able to conserve and, in many cases, to add to the working power of the user, while at the same time leaving him less fatigued at the end of the day.

*Paper presented to the Efficiency Society, Lake Placid, N. Y., September 17, by Frank B. Gilbreth, Frank B. Gilbreth, Inc., Providence, R. I.

Blast-Furnace Projects in Asia

The following statements regarding new Asiatic blast-furnace projects is taken from recent Consular and Trade Reports:

A new pig-iron furnace is to be erected by the Mitsu Bishi Company, of Tokyo, Japan, at Kenjiho, near Pyeng Yang, Chosen (Korea), within the next two years at an estimated cost of 5,500,000 yen ($2,750,000). It is understood that bids have been invited from various companies in England, the United States and Germany. It is planned to erect two furnaces, with a capacity of 150 tons each per day. The product is to go mainly to the steel works at Wakamatsu, Japan, to replace the pig iron now being imported from China. The company owns both coal and iron mines in the vicinity of the proposed furnace, the iron ore from which is said to be very similar to the ore found in the Alabama mines in the United States.

It was reported in the Weekly China Tribune of May 3, 1914, that valuable iron ore had been found in the Kiaochow district, China, the locality from which the Japanese are endeavoring to oust the Germans. The paper adds: "Recent investigations have shown that samples contain 65 per cent. iron, 0.24 per cent. manganese, 0.03 per cent. phosphorus, and 0.08 per cent. sulphur, while the veins of ore are 25 to 50 yd. in thickness. It is estimated that there are about 100,000,000 tons of ore in the district. Its value is still further increased by the fact that there is a plentiful supply of coal in the vicinity. New iron works will be erected at Tsangkau, and will have two blast furnaces, each with an output of 150 tons per day. The capital to be invested will amount to about $2,500,000 gold."

The properties of the bankrupt Pierce, Butler & Pierce Company, Syracuse, N. Y., brought $1,174,538 last week, when they were offered for sale by Judge James P. Hill, trustee. They were bought by Charles H. Sanford, president of the National Bank of Syracuse, in behalf of the reorganization committee of the Pierce, Butler & Pierce Company and the Kellogg-Mackay Company, of Chicago. A new company was incorporated as the Pierce, Butler & Pierce Mfg. Corporation, with Dr. J. T. Duryea, New York, as president. The capital is $2,000,000. The new Kellogg-Mackay Company will have a capital of $900,000, with C. V. Kellogg, Chicago, president.

The Electric Furnace in the Foundry*

Factors Affecting Efficiency and Operation in General—Valuation of Power Consumption—Important Cost Data

BY W. L. MORRISON

It will no doubt take some time and much patience on the part of those operating electric furnaces before reliable and tangible data on their operation and upkeep may be available. All new apparatus must go through the experimental stage; and as is the case with every such apparatus, or article for the market, there are several new electric furnaces offered the public each year which only add to the confusion of the foundryman investigating the advisability of installing such a unit. There are also so many items entering into relative costs between the crucible and the electric furnace method, that the electric refining of steel may be carried to a nicety and still produce steel lower in cost, than can be produced by the crucible method. Although this is the case, the crucible steel manufacturers of to-day are proceeding very cautiously, and it will take several years for them as a body to put faith in the electric furnace.

The electric furnace in the foundry is a more difficult proposition, on account of the keen competition in the steel casting trade. In Europe, raw materials, low wage scale, and low power rates, lend themselves very readily to the production of the higher grade of steel castings in the electric furnace, the electric furnace abroad being in competition with tonnage furnaces.

PRICE OF ELECTRIC STEEL CASTINGS

I believe the future of the electric furnace in the foundry is only insured by a very close analysis of its operation, and the adaptation of its operation so as to cheapen the product and obtain a greater output. This can be done either with an acid or a basic furnace. Under good operating conditions steel can be produced in the ladle from a 2-ton electric furnace at from $20 to $30 per ton where no refining is necessary. This covers low carbon steels of 0.08 to 0.20 per cent. carbon. Taking three heats per day, with ordinary care the average cost of steel in the ladle should not exceed $30, even with power at 1.5c. per kilowatt hour.

The demand at present for an alloy, or plain steel containing more than 0.40 per cent. carbon is very limited, for the heat treatment of steel castings on a large scale is also in its infancy so to speak. This will be a branch of the steel casting industry in which the electric furnace will reign supreme, for in quality and soundness of casting it will supersede the crucible method. Steel can be melted and refined in the electric furnace for from $27 to $35 per ton in the ladle, depending on the power cost, cost of materials and the care of the melter.

An electric furnace installed with the idea that one heat a day will pay its way is disastrous to the foundry. The electric furnace while adapted to foundry work under certain conditions, should not be considered as an ordinary piece of apparatus. It is very delicate, or at least certain parts are, as one finds out in practice. A careless melter can add $5 to $15 to the cost of a heat from electrode breakage, by neglecting to raise his electrodes during the removal of slag, or when charging the furnace.

In the charging of the furnace a certain amount of care must be exercised to insure prompt electrical contact and smooth working of the electrodes. It is very easy to lose an hour or even three hours by poor electrical contact at the offset, due to either poor charging, or poor selection of scrap. Those who have had practical experience with the furnace know how aggravating a poor electrical contact is; on the other hand, a short circuit the moment the arc is made and subsequent surges of current are readily overcome by placing a little slag around the electrodes. Without doubt the electric furnace is an ideal medium for carrying on the reactions necessary for the refining of steel. It is almost like carrying out a reaction in the chemical laboratory.

While very low carbon steel can be made and poured, much difficulty will be encountered, as you all know, if one attempts to pour any considerable amount of steel into small work from one ladle. If it is desired to make 0.10 carbon steel small heats can be made in the electric furnace for very little increase in cost, although the ladle cost of course would run quite high. The making of this low carbon steel and getting it hot enough to pour light work, is done at the expense of the arch of the furnace, which would necessarily need repairs oftener. Forced operations are also hard on the arch. Sharp corners, or angles, should be avoided, as they cut very quickly.

The increased strength of electric steels of similar composition to those made by other processes has not been satisfactorily explained as yet. Even low grade steels made in the electric furnace similar in composition to the converter steels possess superior properties to converter steel. The fact that steel made in the electric furnace is in a reducing atmosphere seems a very plausible reason for the difference in properties. It has been demonstrated frequently that certain alloy steels made in the electric furnace of the arc type, could not be reproduced in the crucible furnace.

In both cases we have a reducing atmosphere. A suggestion as to this difference is that the intense local heating by the "submerged arc" produces certain carbides or combinations of carbides and alloys of the other ingredients in the steel which are not fully understood to-day. The fact that electric steel has less of segregation tends to show a greater uniformity and stability of the alloys of iron when produced in the arc furnace. This fact also helps to explain the superior properties of electric steel castings.

EFFICIENCY AND POWER CONSUMPTION

The efficiency of the electric furnace depends upon three important factors: The electrical design, metallurgical design, and the operation.

The electrical design is perhaps the most important, and is the hardest point for the foundryman to decide upon and understand; for, so to speak, it is the "bone of contention" among those interested in the electric furnace from a sales point of view.

*From a paper presented at the American Foundrymen's Association, Chicago, September 10, 1914.

We hear much talk about kilowatt consumption per ton of steel in the ladle, and because one furnace shows a lower kilowatt consumption than another, it would lead you to think it the more economical to operate, but in reality the power cost might be greater despite the lower kilowatt consumption. The reason for this is that the power factor enters into the power question, and is very important in connection with electric furnaces. A load with a low power factor is very undesirable at the central station, and most electric distributing companies have a penalty for low power factors. If the electric company would allow a low power factor, it would be to the advantage of the consumer operating an electric furnace, to use a furnace with a low power factor as the output would no doubt be greater per kilowatt hour. However, should the power company submit to the low power factor without a penalty, I feel it would only be a matter of time till the power factor would have to be raised by further installation of electrical apparatus.

There are furnaces operating to-day with a power factor of from 90 to 97 per cent., while other furnaces on the market have a power factor as low as 40 to 60 per cent., and in order to raise their electrical efficiency they would need special apparatus, or should be operated by special alternators having a low frequency.

The power consumption of furnaces should be expressed in kilovolt-amperes, so the figures given in technical literature would be less misleading. Take for example the submerged arc type of furnace, with either the three phase or the single phase, operating under similar conditions. Generally speaking the higher the power factor the less will be the kilovolt-ampere consumption. It is understood when speaking of current, or power consumption, that the transformer losses are included. The following is a typical illustration of the above. A certain furnace claims a current consumption of 586 kilowatt hours per ton of steel in the ladle, melting cold scrap, the power factor being 50 to 60 per cent. Another furnace claims 800 kilowatt hours per ton of steel in the ladle under similar conditions, but with a power factor of 90 to 95 per cent.

(1) $586 \div .60 = 976$ kva. hr.
(2) $800 \div .90 = 889$ kva. hr.

The former case appears the more economical of current consumption when considering the kilowatt, but figuring the kilovolt-ampere-consumption, the latter is about 10 per cent. more efficient.

METALLURGICAL DESIGN

The metallurgical design of the furnace should be such as to conserve the heat generated by the electric arc, and facilitate the operation and repairs of the furnace. The design of the furnace for the conservation of the heat, etc., depends to some extent upon the melting stock available, and the quality of the steel to be made, that is whether an acid bottom or a basic bottom be employed. The acid bottom is limited in its scope of operation, for while it produces a very good steel, the refining cannot be carried as far as on a basic bottom. The basic bottom is the one more commonly used.

In regard to choice of material for electrodes for the small furnace, this is somewhat an open question at the present time. To meet the need of large electrodes the amorphous carbon electrodes are being greatly improved, and are replacing the graphite electrodes in the larger furnaces. The recent developments in the manufacture of amorphous electrodes enables the splicing of two sections and spawling is greatly decreased. Generally speaking on small electric steel furnaces three tons capacity and less, operating intermittently the cost of electrodes per ton of steel in the ladle is a little in favor of the graphite. However, on the larger furnaces I understand the large amorphous electrodes are more satisfactory and cheaper per ton of steel made. However, it is well known that the amorphous carbon gives a larger area of cross section for a certain current density.

The larger amorphous carbon electrode gives better distribution of heat to the steel bath, and offers some protection to the arch of the furnace. The grouping of graphite electrodes has been largely replaced by the single amorphous carbon electrode. At present the size of graphite electrodes is limited to 8 inches diameter, on account of difficulties encountered in graphitizing those of larger diameter. The only limit to size of the amorphous carbon electrode is that which will carry safely when the furnace is tilted or during operation.

OPERATION OF THE FURNACE

Producing good steel economically depends largely upon the melter. While a steel melter can be trained for the electric furnace in a shorter time than for the open-hearth, this fact is too often abused, with the loss of heats and cold steel in the ladle. Then, too, often the furnace is blamed for the results when the melter is really to blame.

When it is desired to produce a large tonnage of soft steel, that is, 0.12 to 0.15 per cent. carbon, excellent results may be obtained by the use of one slag, lowering the carbon to near the desired point, and recarburizing, without attempting to whiten the slag. With the proper additions of alloys the steel will pour very fluid and sound castings will result. However, the iron oxide must be used very sparingly for decarburizing, 50 lb. to the ton of scrap usually being sufficient. Steel made this way is not quite so high grade as that made in the usual way, but it can be produced 10 to 25 per cent. cheaper. The basic bottom can be used to compete with the acid lined electric furnace by limiting the refining.

The demand among the jobbers for a low carbon steel casting seems to be increasing, being more of a fad than an actual necessity. Attempting to make steel castings less than 0.10 per cent. carbon, except for special purposes, I consider detrimental to the steel casting trade and especially to the future of the electric furnace. The cost of producing this steel is increased at the furnace, in the foundry, and perhaps one can add, in the cleaning department. The higher temperature required to maintain a fluid metal, necessitates an added repair cost and heavier overhead on the furnace. In the foundry larger shrink heads are required, and there is greater danger from misrun castings lowering the efficiency in the foundry. The gates and risers on the castings are harder to remove where the carbon is low. This is very noticeable even with the oxy-acetylene torch. For the great bulk of small work some foundries are considering raising the carbon content and paying more attention to the annealing.

The costs of operating electric furnaces usually given out to the public are those for ideal conditions. While the manufacturer considering the installation of such a furnace may attain such efficiency, he would be less liable to disappointment if he were to add from 10 to 25 per cent. to the figures given as his possible cost of production. When steel castings have the same attention and care in their manufacture that is given our tool steel, we can hope for greater progress in the electric steel casting industry.

Discussion

F. T. Snyder, of Chicago, contributed a written discussion of Mr. Morrison's paper, extracts from which are as follows:

It is rapidly becoming clear to those of us who are in intimate contact with electric furnace position in the steel field that this field of application is rapidly broadening, and that it does not require very much of a spirit of prophecy to understand that not only the small foundry, but all, including the largest types of open-hearth steel furnaces, are destined to gradually change to an electric basis, just as the present open-hearth practice has grown out of the previous Bessemer practice.

Special attention should be called to Mr. Morrison's statement, that in a 2-ton electric furnace steel can be made from $20 to $30 per ton. We have a definite case in our own practice, where the steel in the ladle, from a furnace of about this size, is being made at a total cost, including all overhead charges, of something under $17 per ton. It might be well to amplify Mr. Morrison's statement in regard to making money per day, by stating that there have been successful installations made in this country from American designed furnaces, in which, on a basis of one heat per day, the furnace has saved the entire cost of installation inside of the first year.

POWER CONSUMPTION

Speaking of the power consumption of electric furnaces, it would seem as though Mr. Morrison had added toward confusing rather than simplifying matters, by introducing the new unit—the kilovolt-ampere hour. In actual electric power plant business there is no such unit in use, and quite properly, its use does not mean anything commercially. All electric power bills are based on the kwhr. and charge is made at a definite rate per kwhr. The watt meter which is used to measure the power does not measure kilovolt-ampere hours, but measures kwhr., and therefore the bill is based on kwhr. and not on kilovolt-ampere hours. It is a fact which has been well demonstrated, in commercial practice, that the kwhr. consumption which has to be paid for an electric furnace is less for a low power factor than it is for a high power factor. In general, in this country for small foundry electric steel furnaces the high power factor furnaces consume from 900 to 1000 kwhr. per ton of steel, while the low power factor furnaces consume from 600 to 700 under the same conditions. At 1c. per kwhr. this makes a saving of $2 per ton of steel to the foundrymen using a low power factor furnace rather than a high power factor furnace.

There is another aspect of the matter, however, which is more important, and that is the power which is saved can be used to melt more steel in the same furnace. In other words, a low power factor furnace will melt from 25 to 35 per cent. more steel per day than a high power factor furnace of the same size.

HIGH AND LOW POWER FACTOR

As to the question of high power factor, the electric power people are interested in having a high power factor, as it enables them to sell more kilowatts of current from the same equipment. When, however, we also take into consideration the foundrymen's point of view, we find that the amount saved to the power company, by using a high power factor furnace, is lost several times over to the foundrymen. The better economic plan is to consider the joint interests of the foundrymen and the power company, and to install low power factor equipment which will enable the greatest amount of joint profit to be made for the foundrymen and for the power company. This economic procedure leaves the larger amount of profit to be divided between the power company and the foundry.

There is a further aspect to the matter. By using a low power factor, special forms of furnace regulation can be used, which very greatly simplify the construction of the furnace. This simplification of furnace equipment means reliability in the ordinary foundry which has to operate with the usual American labor. This matter of the reliability, which comes from simplicity of construction, is the essential difference between European types of electric steel furnaces and the more modern American types. In Europe technically trained engineers are numerous and low priced. In this country competitive conditions are such that the average foundry cannot afford to employ a high grade engineer to keep the auxiliary apparatus of electric furnaces in operation. By utilizing low power factor furnaces the regulation of the furnace can be made a matter of the inherent furnace design, and all auxiliary regulating apparatus of every kind can be eliminated.

Another important aspect of the low power factor is that it permits the use of a flame arc in place of the spot arc. By using such a flame arc which is very large and gives a flame something like an open-hearth furnace, the intensity of the electric heating is greatly diminished, and this shows up in phenomenally low refractory costs, which are being obtained with flame arc furnaces. Refractory costs, for comparatively small furnaces, well below $1 per ton of steel, are not unusual. The flame arc also leads to another important cost saving. With it the amount of current used in amperes is only a small application, from 1/5 to 1/6 of the amperes of current which are required with the spot arc type having a high power factor. This means that the electrode consumption per ton of steel is very low. In no case with the flame arc type of furnace is the electrode consumption over 4 lb. per ton of steel, and in the cases of some well-handled furnaces it has been considerably below 3 lb. per ton of steel.

Increase in Merchandise Exports

It is significant, says the New York *Times* of September 30, that since the third week of August there has been a steady and a rapid rise in the exports of merchandise from New York, the country's chief port. This favorable forward movement has been so marked that since the third week of August, when the low point of $8,400,000 was reached, the weekly merchandise exports from New York have risen to above $20,000,000. The exact figures for last week as reported yesterday were $20,032,132. That is an unusually large total for this season and represents, indeed, the largest weekly merchandise exports since the week ended April 4 last. Just before the war broke out the weekly exports were running between $14,000,000 and $15,000,000.

The Bethlehem Steel Company has made a remarkably good showing for the six months ended in June. The company reports a surplus of $2,869,672, although no allowances for depreciation were made in the report as submitted to the Stock Exchange. This will not be done until the fiscal year is completed. During the six months' period working capital was increased by nearly $500,000. Cash on hand at the end of last June was $3,406,000, compared with $1,963,000 at the end of the last fiscal year.

The City Council of Pittsburgh, Pa., has appropriated $10,000 for the use of the commission recently appointed in that city for the purpose of aiding Pittsburgh manufacturers in securing foreign trade. J. Rogers Flannery, of the American Vanadium Company and the American Flexible Bolt Company, and H. P. Bope, vice-president and general manager of sales of the Carnegie Steel Company, are members of the commission.

ESTABLISHED 1855

THE IRON AGE

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The Lost Panic of 1913

A subscriber in Massachusetts writes with reference to our editorial of a fortnight ago headed "Cyclical Depressions—An Obituary" and questions the accuracy of our conclusion that the cycle is a dead issue because no panic occurred in 1913. He suggests that "the first cycle" showed 10-year intervals, 1837, 1847 and 1857; that the second cycle, starting 16 years later, likewise showed 10-year intervals—1873, 1883 and 1893—while after a 15-year interval a third cycle started with 1908, indicating future panics in 1918 and 1928.

The doctors have disagreed rather widely in the selection of data upon which to build their theories as to cycles, their divergence being due largely to the varying weight they have attached respectively to panics and to industrial depressions. The clearest analysis we have seen lays stress upon the inherent difference between a panic, involving sudden fear and rash action, and an industrial depression involving no action at all. According to the nature of the causes the one or the other may be the principal thing. The conditions may give rise chiefly to a panic, this being in turn the occasion of a relatively mild industrial depression following, or they may be of a nature to cause chiefly an industrial depression, which when clearly foreseen becomes the occasion of a relatively mild panic.

Many may differ, but our judgment is that the chief thing that occurred in the eighteen-nineties was an industrial depression, from 1893 to 1897 inclusive, while the chief thing occurring later was the panic of October, 1907. The gold panic of June, 1893, would have been, we think, a relatively mild affair had not the foundation for an industrial depression been fully laid. We cannot believe that the panic was the sole or even the principal cause of that terrible depression. In the later case, on the other hand, we believe such industrial depression as did occur, much milder and much shorter than that of the nineties, was directly caused by the great panic. Hence we do not regard the 15-year interval from 1893 to 1907 as representing a full cycle, involving a return to a like starting point.

Conditions have changed so greatly from generation to generation in the United States that we are indisposed to accept the periods obtaining beween panics long ago as of close application to the present. In colonial times and the early years of the republic we did not have enough commerce to feel large effects from crises abroad. In 1814 we had a panic due to the capture of our capital by the British, this being naturally local. In 1818 we had another, also local, due to too rapid expansion after the war. The history later indicates clearly four great events, each a major panic followed by a major industrial depression, the panics occurring in 1837, 1857, 1873 and 1893. In 1847 there was a panic abroad, but in the United States the effects, felt chiefly in 1848, were by no means to be compared with those in the other panic and depression periods. Similarly we are disposed to eliminate the 1884 panic which began with the Grant & Ward failure of May, 1884. Our view, obtained from studying many facts of which those just outlined are a few of the most salient, is that events seemed to indicate a complete cycle in 20 years, the shortness of the period from 1857 to 1873, only 16 years, being explained on the ground that the Civil War made things move faster, and for this particular contention we believe there is much ground for argument.

Iron has long been denominated "the barometer of trade" and thus we are justified in using iron statistics as representing the course of trade. Apart from that, however, it is our particular duty to endeavor to interpret general trade movements as to their bearing upon the iron trade. As the iron industry in the United States has grown very rapidly, relatively little attention is to be paid to what occurred long ago, and the closest study should be given to what has occurred more recently. It must be granted that recurrent panics or industrial depressions are not detached phenomena, but must necessarily be connected by series of somewhat similar events. In the events which for a number of years followed 1893 there was a striking agreement with events which followed 1873. The industrial depressions were of almost precisely similar length. The panics were September 18, 1873, and May 3-5, 1893. The "booms" started in May, 1879, and March, 1899. Each was followed, in the iron trade, by a temporary and mild collapse, an important recovery following, more substantial and profitable than the boom. Depression returned in 1883 and 1903, but there was only a minor panic in 1884, and nothing that could really be called a panic in 1903 or 1904. Late in 1885, and practically at the beginning of 1905, recovery started, and the iron trade was very prosperous until nearly the close of 1887 and 1907 respectively. After very dull years, 1888 and 1908, there was recovery in 1889 and 1909, and 1890 and 1910 were both years of extremely large production, but of constantly falling prices.

While the students of general trade conditions

and movements diverge, through selecting different sets of facts by which to gauge the course of trade—bank clearings, discount rates, commercial failures and what-not—the review we have given in the preceding paragraph, of the course of the iron trade, can be established as absolutely true and faithful, by comparison of the two simple but fundamental and controlling elements, tonnage of production and market prices. Statistics are readily available.

The remarkable similarity in practically all details in the course of the iron trade from 1873 through 1890, and from 1893 through 1910, was of vastly more significance in suggesting a "cycle" than was anything that occurred before or immediately after the Civil War. The divergence in events following 1910 and events following 1890 was therefore of great importance. While 1911 patterned in part after 1891, the prosperity of 1912 far exceeded that of 1892, and the decline of 1913 was altogether too mild to bear any comparison with that of 1893. Hence our recent obituary notice for the cycle. It was, as clearly stated, an obituary of a particular cycle, the 20-year one.

It is frankly admitted that there are many who complete the cycle with a 15-year period, setting 1907 alongside 1893. We do not concur in the analysis, as already indicated, because we do not regard the events as containing the same elements, the first panic being the precursor rather than the cause of a very serious industrial depression, the latter being a major panic, followed by a mild industrial depression of which it was largely the cause.

Studying Foreign Customers

Many American manufacturers freely admit that they know little about the preparation of products for shipment to countries such as those of South America. They have depended entirely upon the suggestions of exporters who have occasionally given them orders. A foreign community may have conditions of its own which must be met in the packing or boxing or crating. Even the size and shape of individual parcels is often important, and in some cases it is all important, as when goods are to be forwarded inland from the coast on mule-back. A shoe manufacturer recently received an order from South America for a large lot of goods, which the specifications required should be packed in wooden boxes of given weight and size, lined with tin soldered to make the case airtight. The purpose was to keep out the dampness that might be found in the holds of ships during a long voyage, and in the heavy atmosphere often encountered in the tropics during transportation on land. The builder of machinery may be required to take down a machine and divide it into a number of parcels. He may even be compelled to change features of the design. Perhaps the accustomed casting for some part may be so heavy or so large as to make necessary its division into two pieces, to be bolted together in the installation. The shipping department of every industrial plant that hopes to profit by the new opportunity for trade should be instructed to give diligent study to the various problems of this sort that will arise. The manufacturer cannot afford to rely wholly upon a shipping agent or an exporter, because neither can have a complete knowledge of his product.

First impressions count for a good deal in business and social relations. An initial error may be serious. To correct it may be costly in time and money. This is particularly true with a strange buyer who has become accustomed to a practice which his former business connections took for granted. The South American distributer and user will watch new American products sharply, and perhaps with suspicion. They may have received advance misinformation. The confession is not pleasant to make, but it is a fact that some of our original trading, years ago, with these and other awakening nations, was not wholly creditable. Some of our shippers tried, and often with success, to dump inferior and antiquated products upon ignorant purchasers and were afterward found out and discredited, and the business was given to houses of other nationalities which saw to it that the incident was not forgotten. The story is still told in Shanghai of the effect upon the Chinese trade of the first consignment of American bicycles landed in that port. Machines inferior in material and workmanship and of an old design were offered as the latest model, and presently natives and Europeans had accepted them and were enthusiastic devotees of the new sport. Shortly afterward a shipment of fine machines, the best that could be had in that day, arrived from Europe, and the wheelmen saw the imposition. American products of all descriptions were given a bad name, for all were classed with the inferior bicycles. Such methods as these are now practically unknown among our manufacturers, yet a word of warning to those who have not become acquainted with the possibilities of trade with new countries may not be amiss.

The game to play to-day is to send the best that can be obtained anywhere of its class and price, to accept moderate profits, and to put it up in such a manner as absolutely to meet the requirements of the people. The American manufacturer need not worry about the products he has standardized as to quality and excellence, for they can meet any competition that may arise. But he must know exactly what the new customers want and how they want it.

European Welfare Systems and the War

Students of the various systems that have been evolved in Europe for increasing the welfare of the workman, are speculating seriously upon the results the war may have in shattering what already has been accomplished. Some of the countries engaged in the strife have gone a good way in looking after the employee and his family. The old age pension, insurance against non-employment, workmen's compensation and like systems have been created and put upon a substantial working basis. The chief purpose has been to get rid of pauperism, to keep men and women self-respecting. Large funds have been accumulated through the compulsory contributions of the government, the employer and the employee, who is the beneficiary. Millions of men have been taken into these systems, and a very large percentage of them have been withdrawn from their labor and compelled to serve in the army. Many thousands have already been killed, and vast num-

bers have been crippled for life, and the list is increasing by tens of thousands. The future employment of the disabled men must be something different from that in which they were brought up, and in which they are insured against non-employment and for the comfort of their declining days. Years will be required to build up these systems again, and there will be the prodigious task of allotting the accumulated funds among those who can no longer labor effectively and the families of those who are dead. It will be one factor in retarding the reestablishment of industry when peace is at length restored.

Apropos of the communication in our last issue contrasting the decimation of Europe's industrial forces with what is now being done in the United States to conserve the lives and the efficiency of workmen: It was not so long ago that German industrial leaders called American manufacturers little regardful of life and limb. The Prussian minister of commerce, after visiting the United States some years ago, wrote that employers here were "very careless about the life and health of the working classes; in the largest works the precautions against accident are of the most primitive kind." Germany's care of her workmen in time of peace has been a model for the world; that is one reason why it has been possible for her to throw into the field such a vast army of fit men as is under arms to-day.

Pig Iron and Scrap Prices

Basic pig iron has been quoted for about six months at $13 at Valley furnace, or $13.90, delivered Pittsburgh. Heavy melting steel scrap is now quoted at $11, delivered in the Pittsburgh district, or $2.90 below the delivered price of basic iron. A similar comparison of annual average prices is as follows:

	Pig Iron	Scrap	Difference
1904	$13.40	$12.89	$0.51
1905	16.02	16.10	*.08
1906	19.12	16.49	2.63
1907	21.81	17.22	4.59
1908	16.11	14.00	2.11
1909	16.42	16.34	.08
1910	15.63	15.42	.21
1911	14.00	13.13	.87
1912	14.80	13.76	1.04
1913	15.67	13.07	2.60

*Scrap above pig iron; below pig iron in all other years.

These statistics tell an important story very plainly. One condition existed up to about three years ago, and another condition has existed since then, the later established condition becoming more and more pronounced. The years 1906-7-8 must be segregated, being altogether exceptional. In those years pig iron was very high priced, and scrap could not follow the full distance; hence scrap was much below pig iron. Otherwise scrap was only a shade below pig iron, averaging only 25 to 50 cents a ton below. In 1911 and 1912 scrap averaged a dollar a ton below pig iron; in 1913 it was $2.60 below, and now it is $2.90 below.

Under certain restrictions, heavy melting steel scrap is worth more than pig iron, delivered to the basic open-hearth steel furnace. When the proportions are roughly half scrap and half pig iron, both charged cold, an increased proportion of scrap charged decreases the time of finishing the heat, and the bath loses less in weight by the scrap charged than by the pig iron charged. When molten pig iron is available the condition changes entirely, for in making steel molten pig iron is worth more than cold pig iron. So would molten steel scrap be worth more than cold steel scrap. Even then there is a limit, however. Molten material is certainly not worth $2.90 more than cold material.

Market prices do not reflect actual metallurgical conditions as to the value of the raw materials, however, for various reasons, the most important one being that the major portion of the steel made is by steel interests that make the pig iron themselves and presumably have a profit in the operation.

In recent months there has been an additional influence, in that the large steel producers have all been pursuing a policy of retrenchment and endeavoring to reduce their stocks of ore. To buy a ton of scrap is to expend a certain amount of money. To consume a ton of pig iron is to convert unproductive investment in ore into cash. The practice of this policy of curtailment of unproductive investment in connection with the production of a large tonnage of steel is in part responsible for the divergence between market prices of scrap and pig iron, delivered at steel works. Assuming the supplies of scrap and pig iron to be so proportioned that the best practice is assured, in shortness of time in converting the materials into steel and in quality of steel, the divergence in market prices of scrap and pig iron should be fairly representative of the profit in making pig iron by the large steel interests, plus the expense involved in using cold scrap instead of molten pig iron. When the divergence varies from this standard some other influence is at work. One such influence, as suggested, seems to be the desire to convert ore into liquid capital. Another influence is probably effective at this time. As industry in general slows down scrap becomes relatively a drug, because the outcome or production of scrap at any given time is in relation to the rate of production of steel some weeks earlier, while the tendency to buy scrap is in relation to the expected consumption by steel works some weeks hence. On the other hand, as industrial activity increases, the consumption of scrap increases sooner than does its production; hence scrap becomes at such times abnormally scarce.

Thus there is reason to infer that while the market price spread of scrap below pig iron has increased within the past three years, and permanently, the spread at the moment is abnormally large, due to the incidence of influences that cannot be at work permanently.

Gasoline Should Not Be Taxed

The proposed tax on gasoline appears to be one of the most objectionable features of the war revenue bill passed by the House of Representatives. This tax will fall on the consumer of gasoline and not on the producer. It was assumed by those responsible for the inclusion of this article as a subject for taxation that it would be borne by the producers of oil, who are popularly supposed to be reaping large profits. It will, however, fall directly on commercial, manufacturing

and agricultural industries, as the tax will undoubtedly be added to the commercial price.

The fact is pointed out that the cost of necessaries of everyday life will thus be increased, as approximately 100,000 motor trucks and delivery wagons are used by manufacturers, by wholesale and retail dealers in coal and food products and by produce dealers, farmers, truck gardeners and dairymen. It would be difficult to estimate how many gasoline engines are used by manufacturers, farmers and others operating engines of small power but who in the aggregate are large consumers of this liquid fuel. The tax on owners of automobiles for pleasure purposes will be a serious matter, and more than this it will be in the nature of a surtax, as owners of automobiles in most States pay a personal property tax on their motors and a heavy tax annually under the provisions for exacting registration fees, while in some counties and cities an additional special tax is levied for local road and street improvement. It probably has not occurred to some of our law makers that the proposition to levy a tax of 2 cents on every gallon of gasoline means the imposition of 10 to 15 per cent. on the cost to the consumer. Where can be found another article, except perhaps certain wines, on which the proposed tax bears so high a relation to its value?

CORRESPONDENCE

A Critic of American Export Policy in Practice

To the Editor: We read with mixed emotions your battle cry, "A Message to Men," recently printed in your advertising pages. It sounds good, but we have heard so much of this "We-are-the-greatest-on-earth" talk that we are just about ready to accept the word of the Germans and the English and the natives themselves that ours is the "sounding brass and the tinkling cymbal." What we mean will be apparent from the following quotations. The first is from a prominent New York commission house, and we are assured is the sentiment of New York exporters:

Cable: "Please inform your friends that can not take your orders unless you open a credit in our favor here."

Letter: ". . . We regret having to inform you that we must discontinue shipment of your esteemed orders until general conditions have become more settled."

The following are from a prominent manufacturer and commission house in England, a country now actually at war:

Letter, dated Aug. 22, 1914: "We shall continue to make shipments of any orders on hand and for your guidance we would mention all goods will be covered with war risk, as it is, of course, in the client's interest to include the latter risk."

Here is one from Hamburg. Certainly we can but admire the spirit of these people. We can read between the lines why they have become a power which all other nations fear.

Letter, Aug. 14: "The dispatch of these goods will be somewhat delayed owing to the war and the complete interruption of traffic. As soon as the situation improves we will send them without further delay."

Here is no "hauling down the flag," here is no "lying down." No talk of credits. Here is a nation in a death struggle, yet continuing to conserve its business and take care of its customers, extending to them the same six months credit as if the war did not exist.

On the other hand here is the United States with "a hundred million people with an untrammeled working organization"—and all the rest of the Fourth of July stuff, offering its material in some such manner as we would picture, were we artistic, with crayon: a big Uncle Sam with his left hand behind his back holding the supplies that the world wants and his right hand extended for the *cash* against documents, New York. The title of this sketch would be, "Let's see the color of your coin first, son."

HUBBARD & Co.

San José, Costa Rica, September 15, 1914.

Canadian Buyers and the Duty on Advertising Matter

To the Editor:—We have read with much interest the letter on page 726 of your issue of September 24, headed "Duty on Advertising Matter to Canada," and we agree heartily with the writer. If there is any one thing aside from the natural bother of clearing their goods from customs that causes annoyance and trouble to American manufacturers it is the nuisance of having advertising matter requested on order by Canadian jobbers and retailers and then having it returned marked "Duty refused." This has undoubtedly happened to every large American manufacturer dealing extensively in Canada. It has been a source of quite a little bother to us. We have had to delay customers' shipments many times in order to get printed matter in so that it would not be held up by the customs people nor refused by the dealers in Canada.

Recently there has been a let-up in this matter, as our Canadian customers are realizing the importance of having the co-operation of manufacturers and they have seemed very glad to pay the small duty on the printed matter and get it through without delay. However, we believe that everything that will make trading between these two countries run more smoothly should be done, and we will welcome any movement tending to obviate this particular trouble.

T. A. WILLSON & Co., INC.

Reading, Pa., September 25, 1914.

CONTENTS

The Iron and Metal Markets

EXPORTS ARE LARGER

With Steel Corporation, Nearly Normal

Outlook for Domestic Business Not Encouraging —Sheet Bar Sales to England

With little prospect of a change in the unfavorable conditions at home in the remaining months of the year, the steel trade is getting some satisfaction from export orders and the further developments looked for in that direction. The Steel Corporation is now booking foreign business at practically the rate at which it was coming in before the war, which indicates good progress in September.

With British rolling mills operating at about 50 per cent. of capacity, and steel works there running nearly full, no large amount of semi-finished steel need be drawn from this country. About 15,000 tons of sheet bars have been sold in this country to England and it is expected this total will be increased to 100,000 tons by the end of October. But nothing like the amount usually bought from Germany will be needed under present conditions.

British buyers have made it plain that the prices first named for American sheet bars were too high, and their ability to supply a large part of their requirements at home has brought better terms from this side.

Wire products are still prominent in foreign inquiries, and the total now up, including wire rods, is put at close to 25,000 tons. In plates a further item is several thousand tons for Australia, 12,000 tons for a water pipe line there having recently been closed. Russia is in the market for 10,000 tons of plates. In general the prices the mills are now quoting export houses on finished material are lower than were named in August, when the idea prevailed that the world must soon turn to this market for its steel.

There has been some stir in the sheet trade over the report that the British Government would buy 100,000 tons of galvanized sheets for barracks for winter quarters. On this we have cable advices that some time ago the British Government intimated that it would want this amount, and thus far it has ordered about 30,000 tons. Nothing is likely to be placed in this country, as British exports of galvanized sheets, usually 60,000 tons a month, have been practically suspended.

The decline in specifications and the greater falling off in new orders in September have left steel companies little encouraged over the outlook at home. There is no expectation that the railroads will materially increase their use of steel for some months. As things are, some railroad material has already gone through the mills which is to have 1915 billing.

In the Chicago district mills have not been for years so short of work in heavy products. Shapes and plates, it is admitted, could be bought there now at $1 to $2 under the 1.20c., Pittsburgh, basis.

Structural works report about 105,000 tons of live projects pending, but that represents less than two weeks' work for the fabricators of steel. Recent competition has shown that a 1.10c. basis is frequently figured on, and in the case of the Mail and Express building at the Grand Central terminal in New York, which will require 6600 tons, that figure has not been minimum.

Some bar business has been done for the first half of next year, including a 7000-ton contract at Cleveland. Consumers have shown a willingness to pay 1.20c., Pittsburgh, for such delivery but bar mills as a rule will not tie up at that figure. In bar iron some low prices have been made in the Central West, a Chicago mill having sold at 1.05c. in Ohio, and as low as 1c. is reported.

Weakness has appeared in billets and sheet bars and the market is now nearer $20 and $21 than the $1 higher prices generally quoted in September.

Such stagnation as has come upon the pig iron market has probably not been seen since 1896. In lieu of business, sellers of Southern pig iron have been exercised over the failure of certain roads in Central territory to make the reduction of 35 cents on Southern iron which was called for in the Commerce Commission's order in July. Two sets of rates are now in effect in that territory and the matter will again go to the commission for adjustment.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous.

	Sept. 30, 1914.	Sept. 23, 1914.	Aug. 26, 1914.	Sept. 24, 1913.
Pig Iron, Per Gross Ton:				
No. 2 X, Philadelphia	$14.75	$14.75	$14.75	$16.00
No. 2, Valley furnace	13.00	13.00	13.00	14.00
No. 2 Southern, Cin'ti	13.25	13.25	13.25	14.25
No. 2, Birmingham, Ala.	10.00	10.00	10.00	11.00
No. 2, furnace, Chicago*	13.00	13.00	13.50	15.00
Basic, del'd, eastern Pa.	14.00	14.00	14.00	15.25
Basic, Valley furnace	13.00	13.00	13.00	14.00
Bessemer, Pittsburgh	14.90	14.90	14.90	16.65
Malleable Bess., Ch'go*	*13.00*	13.25	14.00	15.00
Gray forge, Pittsburgh	13.65	13.65	13.65	14.25
L. S. charcoal, Chicago	15.75	15.75	15.75	14.75
Billets, etc., Per Gross Ton:				
Bess. billets, Pittsburgh	21.00	21.00	21.00	24.50
O.-h. billets, Pittsburgh	21.00	21.00	21.00	24.00
O.-h. sheet bars, P'gh	22.00	22.00	22.00	25.00
Forging billets, base, P'gh.	26.00	26.00	26.00	30.00
O.-h. billets, Phila.	23.40	23.40	23.40	25.00
Wire rods, Pittsburgh	26.00	26.00	26.00	27.00
Old Material, Per Gross Ton:				
Iron rails, Chicago	*11.25*	12.00	12.00	14.00
Iron rails, Philadelphia	14.00	14.00	14.00	17.50
Carwheels, Chicago	10.75	10.75	11.25	12.25
Carwheels, Philadelphia	11.00	11.00	11.50	13.00
Heavy steel scrap, P'gh.	11.00	11.00	11.25	12.25
Heavy steel scrap, Phila.	10.50	10.50	10.50	11.75
Heavy steel scrap, Ch'go.	*8.50*	9.00	9.50	10.00
No. 1 cast, Pittsburgh	11.50	11.50	11.50	12.25
No. 1 cast, Philadelphia	12.00	12.00	12.00	11.75
No. 1 cast, Ch'go (net ton)	9.00	9.00	9.50	10.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Bess. rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia	1.12	1.12	1.17½	1.32½
Iron bars, Pittsburgh	1.15	1.15	1.20	1.55
Iron bars, Chicago	1.05	1.05	1.07½	1.35
Steel bars, Pittsburgh	1.20	1.20	1.20	1.40
Steel bars, New York	1.36	1.36	1.36	1.56
Tank plates, Pittsburgh	1.20	1.20	1.20	1.40
Tank plates, New York	*1.31*	1.36	1.36	1.56
Beams, etc., Pittsburgh	1.20	1.20	1.20	1.40
Beams, etc., New York	1.36	1.36	1.36	1.56
Skelp, grooved steel, P'gh	*1.15*	1.20	1.20	1.35
Skelp, sheared steel, P'gh	*1.20*	1.25	1.25	1.45
Steel hoops, Pittsburgh	1.30	1.30	1.30	1.60
Sheets, Nails and Wire,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh.	1.95	1.95	1.90	2.10
Galv. sheets, No. 28, P'gh	2.95	2.95	2.90	3.10
Wire nails, Pittsburgh	1.60	1.60	1.60	1.65
Cut nails, Pittsburgh	1.60	1.60	1.60	1.60
Fence wire, base, P'gh	1.40	1.40	1.40	1.45
Barb wire, galv., P'gh	2.00	2.00	2.00	2.05

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Coke, Connellsville, Per Net Ton at Oven:	Sept. 30, 1914.	Sept. 23, 1914.	Aug. 26, 1914.	Sept. 24, 1913.
Furnace coke, prompt	$1.60	$1.60	$1.70	$2.15
Furnace coke, future	1.75	1.75	1.75	2.25
Foundry coke, prompt	2.00	2.00	2.25	2.90
Foundry coke, future	2.15	2.15	2.35	3.00

Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.25	12.50	13.00	17.00
Electrolytic copper, N. Y.	11.75	11.87½	12.37½	16.75
Spelter, St. Louis	5.00	5.20	5.90	5.65
Spelter, New York	5.15	5.35	6.05	5.80
Lead, St. Louis	3.57½	3.67½	3.72½	4.60
Lead, New York	3.75	3.85	3.87½	4.75
Tin, New York	30.87½	31.60	39.00	41.85
Antimony, Hallett's, N. Y.	10.00	10.00	16.00	7.75
Tin plate, 100-lb. box, P'gh	$3.30	$3.30	$3.50	$3.50

Finished Iron and Steel f. o. b. Pittsburgh

Freight rates from Pittsburgh, in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Louis, 22½c.; Kansas City, 42½c.; Omaha, 42½c.; St. Paul, 32c.; Denver, 84½c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes. The foregoing rates to the Pacific coast are by rail. The rate via New York and the Panama Canal on plates, shapes, etc., is 46c.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.20c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers with extras:

Rectangular plates, tank steel or conforming to manufacturer's standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft., are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft. down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras	Cents per lb.
Gauges under ¼ in. to and including 3-16 in.	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including straight taper plates), 3 ft. and over	.10
Complete circles 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths, under 3 ft. to 2 ft. inclusive	.25
Cutting to lengths, under 2 ft. to 1 ft. inclusive	.50
Cutting to lengths, under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees, 3 in. and over, 1.20c. to 1.25c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.	.10
H-beams over 18 in.	.10
Angles over 6 in., on one or both legs	.10
Angles, 3 in. on one or both legs, less than ¼ in. thick, as per steel bar card, Sept. 1, 1909	.70
Tees, structural sizes (except elevator, handrail, car truck and conductor rail)	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909	.20 to .80
Deck beams and bulb angles	.30
Hand rail tees	.75
Cutting to lengths, under 3 ft. to 2 ft. inclusive	.25
Cutting to lengths, under 2 ft. to 1 ft. inclusive	.50
Cutting to lengths, under 1 ft.	1.55

No charge for cutting to lengths 3 ft. and over.

Wire Products.—Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days or 2 per cent. discount in 10 days, carload lots to jobbers, annealed, $1.40; galvanized, $1.80. Galvanized barb wire and fence staples to jobbers, $2; painted, $1.60. Wire nails to jobbers, $1.60. Woven wire fencing, 73 per cent. off list for carloads; 72 off for 1000-rod lots; 71 off for less than 1000-rod lots.

The following table gives the price to retail merchants on fence wire in less than carloads, with the extras added to the base price:

Plain Wire, per 100 lb.

Nos.	0 to 9	10	11	12&12½	13	14	15	16
Annealed	$1.55	$1.60	$1.65	$1.70	$1.80	$1.90	$2.00	$2.10
Galvanized	2.00	2.00	2.05	2.10	2.20	2.30	2.70	2.80

Wire Rods.—Bessemer, open-hearth and chain rods, $26 to $26.50.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on steel pipe in effect from April 20, 1914, and iron pipe from June 2, 1913, all full weight:

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛, ¼ and ⅜	73	52½	⅛ and ¼	66	47
½	77	66½	⅜	65	46
¾ to 3	80	71½	½	69	56
			¾ to 2½	72	61

Lap Weld

2	77	68½	1⅛	56	45
2½ to 6	79	70½	1½	67	56
7 to 12	76	65½	2	68	58
13 to 15	53	..	2½ to 4	70	61
			4½ to 6	70	61
			7 to 12	68	55

Reamed and Drifted

1 to 3, butt	78	69½	1 to 1½, butt	70	59
2, lap	75	66½	2, butt	70	59
2½ to 6, lap	77	68½	1¼, lap	54	43
			1½, lap	65	54
			2, lap	66	56
			2½ to 4, lap	68	59

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	68	57½	⅜	63	52
½	73	66½	½	67	60
¾ to 1½	77	70½	¾ to 1½	71	62
2 to 3	78	71½	2 and 2½	72	63

Lap Weld, extra strong, plain ends

2	74	65½	1½	65	59
2½ to 4	76	67½	2	66	58
4½ to 6	75	66½	2½ to 4	70	61
7 to 8	68	57½	4½ to 6	69	60
9 to 12	63	52½	7 to 8	63	53
			9 to 12	58	47

Butt Weld, double extra strong, plain ends

½	63	56½	½	57	49
¾ to 1½	66	59½	⅝ to 1½	60	52
2 to 2½	68	61½	2 and 2½	62	54

Lap Weld, double extra strong, plain ends

2	64	57½	2	55	49
2½ to 4	66	59½	2½ to 4	60	54
4½ to 6	65	58½	4½ to 6	59	53
7 to 8	58	47½	7 to 8	52	42

To the large jobbing trade an additional 5 and 2½ per cent. is allowed over the above discounts.

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Boiler Tubes.—Discounts to jobbers, in carloads, in effect from May 1, 1914, on steel and from January 2, 1914, on iron, are as follows:

Lap Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	62	1½ in.	45
2¼ in.	59	1¾ and 2 in.	49
2½ and 2¾ in.	65	2¼ in.	45
3 and 3¼ in.	70	2½ to 2¾ in.	54
3½ and 4½ in.	72	3 and 3¼ in.	57
5 and 6 in.	65	3½ and 4½ in.	60
7 to 13 in.	62	5 and 6 in.	49

Locomotive and steamship special charcoal grades bring higher prices.

2½ in. and smaller, over 18 ft., 10 per cent. net extra.

2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft., and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discount, lowered by two points. On standard charcoal iron tubes for desirable orders the above discounts are shaded an extra 5, and occasionally two 5's by some makers.

Sheets.—Makers' prices for mill shipment on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows, f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice:

Blue Annealed Sheets

	Cents per lb.
Nos. 3 to 8	1.40 to 1.45
Nos. 9 to 10	1.45 to 1.50
Nos. 11 and 12	1.50 to 1.55
Nos. 13 and 14	1.60 to 1.65
Nos. 15 and 16	1.70 to 1.75

Box Annealed Sheets, Cold Rolled

	Cents per lb.
Nos. 10 and 11	1.60 to 1.65
No. 12	1.60 to 1.65
Nos. 13 and 14	1.65 to 1.70
Nos. 15 and 16	1.70 to 1.75
Nos. 17 to 21	1.75 to 1.80
Nos. 22 and 24	1.80 to 1.85
Nos. 25 and 26	1.85 to 1.90
No. 27	1.90 to 1.95
No. 28	1.95 to 2.00
No. 29	2.00 to 2.05
No. 30	2.10 to 2.15

Galvanized Sheets of Black Sheet Gauge

	Cents per lb.
Nos. 10 and 11	1.95 to 2.00
No. 12	2.05 to 2.10
Nos. 13 and 14	2.05 to 2.10
Nos. 15 and 16	2.20 to 2.25
Nos. 17 to 21	2.35 to 2.40
Nos. 22 and 24	2.50 to 2.55
Nos. 25 and 26	2.65 to 2.70
No. 27	2.80 to 2.85
No. 28	2.95 to 3.00
No. 29	3.10 to 3.15
No. 30	3.25 to 3.30

Pittsburgh

PITTSBURGH, PA., September 29, 1914.

A very encouraging feature of the situation that has developed in the past week is the heavier foreign inquiry for nearly all lines of semi-finished and finished steel. Negotiations involving thousands of tons of wire products are under way, and some business in nails, wire and wire rods has been closed. There are also inquiries for billets, and it is reported the United States Steel Products Company has already closed, or will shortly secure, several large contracts for sheet bars for shipment to England. A company at New Brighton, Pa., has received several fair-sized orders for horseshoe nails for shipment to England and France, which business had formerly gone to Germany. In all cases prices secured on foreign business have been as good or better than for domestic business. The local demand continues dull, and specifications against contracts have not been so good in September as in August. The consuming trade is pretty well covered for the remainder of this year, and is not eager to take hold for first quarter at present prices. In the last three or four days of September, specifications against contracts have been fairly active, as probably any unspecified tonnage on these contracts would be cancelled. Most prices are steady, but on plates and steel bars are not so firm as they were.

Pig Iron.—The local market continues practically stagnant. There is no new inquiry for Bessemer or basic iron, and orders for foundry are confined to small lots running up to 200 or 300 tons. Foundries in this district are doing very little and their melt of pig iron is lighter than for some years. In the absence of new business we quote prices nominally as follows: Bessemer, $14; basic, $13; malleable Bessemer, $13; No. 2 foundry, $13 to $13.50; gray forge, $12.75, all at Valley furnace, with a freight rate of 90c. a ton for Cleveland or Pittsburgh delivery.

Billets and Sheet Bars.—Some weakness in prices on billets and sheet bars has developed, and unless general conditions improve it is doubtful whether $21 on billets and $22 on sheet bars for last quarter can be obtained. Sheet mills are making the argument that prices on sheets are not so strong as they were, and to get business they are compelled to make concessions, hence are asking the steel mills to help them out by giving them cheaper sheet bars. Specifications in September against contracts for sheet bars were good, and the rail and billet bureau of the Carnegie Steel Company will show an increase in tonnage this month over August. Little new business is being placed in billets or sheet bars, as consumers are covered by long time contracts. We quote Bessemer and open-hearth billets, $21; Bessemer and open-hearth sheet bars, $22, Pittsburgh mill, freight added to point of delivery, and $1 lower Youngstown; forging billets at $26 for sizes up to but not including 10 x 10 in., and for carbons up to 0.25, the regular extras being charged for larger sizes and higher carbons. Forging billets running above 0.25 to 0.60 carbon take $1 per ton extra. We quote axle billets at $24 to $25, f.o.b. Pittsburgh, depending on the order.

Ferroalloys.—The Carnegie Steel Company is receiving through the United States Steel Products Company, foreign inquiries for ferromanganese, ferrosilicon and spiegeleisen. Prices have been quoted on these inquiries, but it is too early to know whether any business will result. It will furnish ferrosilicon for foreign shipment if its quoted prices are met. Consumers report they are now getting better deliveries on their contracts for ferromanganese, and importers are still quoting $80, seaboard, on English 80 per cent. On contracts taken some months ago, some as low as $35, and others as high as $37 and $38, deliveries are coming forward quite freely, but consumers are paying about $2.50 per ton extra to cover increased freights, insurance, etc. One English maker is asking $15 advance over prices named in contracts, and a few customers of its American representative are paying the advance under protest. One of the stacks at Dunbar, Pa., owned by the American Manganese Mfg. Company, is scheduled to start this week, but will probably not make any ferromanganese for two or three weeks yet. We quote English 80 per cent. ferromanganese at $80, seaboard, but no new sales are reported in this market. We quote 50 per cent. ferrosilicon, in lots up to 100 tons, at $73; over 100 tons to 600 tons, $72; over 600 tons, $71, delivered in the Pittsburgh district. On 10 per cent. ferrosilicon the quotation is $19; 11 per cent., $20, and 12 per cent., $21, f.o.b. cars Jackson County, Ohio, or Ashland, Ky., furnace. We quote 20 per cent. spiegeleisen at $25 at furnace. We quote ferrotitanium at 8c. per lb. in carloads; 10c. in 2000-lb. lots and over, and 12½c. in less than 2000-lb. lots.

Steel Rails.—The Carnegie Steel Company has taken 1000 tons of standard sections for the Toledo, St. Louis & Western for October rolling, but otherwise only a few small orders are being placed. No standard sections are being rolled at the Edgar Thomson works this week, the output being billets, sheet bars and light rails. The same company received new orders and specifications last week for 3260 tons of light rails. We quote light rails, rolled from billets, as follows: 25, 30, 35, 40 and 45 lb. sections at 1.15c.; 16 and 20 lb., 1.20c.; 12 and 14 lb., 1.25c., and 8 and 10 lb., 1.30c., in carload lots, f.o.b. Pittsburgh. Rerolled light rails are being quoted at $1 and $2 a ton less than the above prices.

Structural Material.—The American Bridge Company, through the United States Steel Products Company, has taken 5500 to 6000 tons of shapes for the Cristobal coaling station at Panama, the plain material to be rolled by the Carnegie Steel Company. The Fort Pitt Bridge Works has taken 1500 tons for the Congress street bridge, Troy, N. Y., and the McClintic-Marshall Company 468 tons for storage bins for the Lehigh Coke Company, South Bethlehem, Pa. New inquiry is light, and the outlook is not good. We continue to quote beams and channels up to 15-in. at 1.20c., Pittsburgh, on new orders, but only a relatively small amount of business has been placed at this price, as fabricators were covered ahead at lower figures.

Plates.—Press reports that the Western Steel Car & Foundry Company had received some large new orders for steel cars, and also for repair work on old cars, are much exaggerated. These reports stated that the company would repair 2500 Nickel Plate cars, while the exact number is about 200, and more than half have been shipped. The reported new orders for 450 box cars for the Delaware, Lackawanna & Western and 1000 ore cars for the Duluth, Mesabi & Northern were placed months ago, and have been built and shipped. The company is repairing some box cars for the Illinois Central, but the number is much less than 1500, as given in the daily press reports. The Pressed Steel Car Company here has not received a new order for steel cars since the European war broke out. The Woods Run plant of the company is closed entirely, and the McKees Rocks works is finishing up some odds and ends of orders, and will close early in November, unless new orders are received. The price of 1.20c. on sheared plates is weak, some of the Eastern mills shading it for nearby delivery $1 to $2 a ton. We continue to quote ¼-in. and heavier plates at 1.20c., Pittsburgh, for

delivery in this district, but not enough new business has come out since this price was established to test it.

Steel Wheels.—No new orders are being placed and prices are unchanged. We quote wrought-steel car wheels as follows: 33-in. engine truck wheels, $22.50; 36-in. engine truck wheels, $23.50; 33-in. tender wheels, $18.50; 36-in. passenger car and tender wheels, $21.50; 33-in. freight car wheels, $15.50, all with standard 2½-in. rims and minimum standard hubs.

Skelp.—Some of the pipe mills that roll their own skelp are not having enough demand for pipe to take their output of skelp, and are offering the surplus in the open market at low prices. It is said that sheared steel plates, rolled on skelp mills, have sold as low as 1.15c., Pittsburgh. There is still some inquiry coming in for skelp for foreign delivery, but so far little business has been closed. For domestic orders we quote: Grooved steel skelp, 1.15c., sheared steel skelp, 1.20c.; grooved iron skelp, 1.50c., and sheared iron skelp, 1.60c., delivered to consumers' mills in the Pittsburgh district.

Wire Rods.—Local makers report that foreign inquiries are still coming in, and it is said 8000 to 10,000 tons are now under negotiations for shipment to England and other foreign markets. On considerable shipments already made, as high as $27, Pittsburgh, has been obtained. For domestic delivery we continue to quote Bessemer, open-hearth and chain rods at $26, f.o.b. Pittsburgh.

Iron and Steel Bars.—There is little new demand for iron and steel bars, and prices continue weak. One local maker states it is holding iron bars at 1.25c., but this price is being shaded. Specifications against contracts are quiet. The price of 1.20c. on steel bars is none too firm, and if any large new business was coming out it would probably be shaded. We quote steel bars at 1.20c. for remainder of the year delivery, and common iron bars at 1.15c. to 1.20c., f.o.b. Pittsburgh.

Sheets.—The new demand is quiet, but specifications against contracts placed a month or two ago, when prices were lower than they are now, are coming in at a fair rate. Most mills continue to quote 2c. for No. 28 Bessemer black and 3c. for No. 28 galvanized, but other mills are naming 1.95c. for black and 2.95c. for galvanized, with reports that 2.90c. on galvanized has been done. Eastern reports received here that the British Government is expected to buy 100,000 tons of sheets for the erection of barracks for winter quarters for British soldiers cannot be confirmed here. Several of the larger sheet mills state they have no knowledge of this inquiry. We quote Nos. 9 and 10 blue annealed sheets at 1.40c. to 1.45c.; No. 28 Bessemer black, 1.95c. to 2c.; No. 28 galvanized, 2.95c. to 3c., f.o.b Pittsburgh, the lower prices being for prompt delivery and the higher prices for shipment over the next two or three months. We quote No. 28 black plate, tin mill sizes, H. R. and A., at 1.95c. to 2c.; Nos. 29 and 30, 2c. to 2.05c. The above prices are for carload and larger lots, f.o.b. Pittsburgh, jobbers charging the usual advances for small lots from store.

Tin Plate.—Specifications against contracts have not been so heavy in September as in August. Some contracts have already been completed and others will be shortly. Makers have been asked to name prices for next year, but have refused to do so thus far, owing to the uncertainty as to prices of pig tin. The American Sheet & Tin Plate Company is holding its price at $3.50 per base box on new business for prompt shipment, but little is coming out. Other makers are quoting $3.40, and in some cases as low as $3.30. We continue to quote 100-lb. 14 x 20 coke plates at $3.30 to $3.50 per base box, and 100-lb. 14 x 20 terne plates at $3.30 to $3.40 per base box, f.o.b. Pittsburgh.

Wire Products.—The local market is more active than for some time, due largely to the heavy foreign inquiry for rods, wire and wire nails. Some business has been closed, and it looks as though foreign business will be a considerable factor with local wire mills before long. Several have named prices on the inquiry for 5000 tons of barb wire for Russia. It is estimated that negotiations are under way for 25,000 tons or more of wire products for foreign delivery. Some shipments of wire nails have been made to England and one or two other foreign countries, on which the full price of $1.60, Pittsburgh, was obtained. The domestic demand for wire and wire nails is quiet, but specifications against contracts are fairly active, and the wire nails are busier than for some months. On new orders we quote wire nails at $1.60; plain annealed wire, $1.40; galvanized barb wire and fence staples, $2; painted barb wire, $1.60, all f.o.b. Pittsburgh, freight added to point of delivery, terms 30 days net, less 2 per cent. off for cash in 10 days. We quote steel cut nails at $1.60 to $1.65, f.o.b. Pittsburgh, in carload lots. We quote woven wire fencing at 73 per cent. off in carload lots, 72 on 1000-rod lots, and 71 on smaller lots, all f.o.b. Pittsburgh.

Nuts, Bolts and Rivets.—The new demand for nuts, bolts and rivets is dull and only for small lots, consumers being covered for some time ahead. Prices on rivets are weaker, structural rivets selling as low as 1.50c. and boiler rivets at 1.60c. Prices on nuts and bolts are weak. Some makers are not operating to more than 25 to 30 per cent. of capacity. Discounts on nuts and bolts are as follows in lots of 300 lb. or over, delivered within a 20c. freight radius of maker's works:

Coach and lag screws	80 and 5% off
Small carriage bolts, cut threads	80% off
Small carriage bolts, rolled threads	80 and 5% off
Large carriage bolts	75 and 5% off
Small machine bolts, cut threads	80 and 5% off
Small machine bolts, rolled threads	80 and 10% off
Large machine bolts	75 and 10% off
Machine bolts, c.p.c. & t nuts, small	80% off
Machine bolts, c.p.c. & t nuts, large	75 and 5% off
Square h.p. nuts, blank and tapped	$6.30 off list
Hexagon nuts	$7.20 off list
C.P.C. and r sq. nuts, blank and tapped	$6.00 off list
Hexagon nuts, ⅝ in. and larger	$7.20 off list
Hexagon nuts, smaller than ½ in.	$7.80 off list
C.P. plain square nuts	$5.50 off list
C.P. plain hexagon nuts	$5.90 off list
Semi-fin. hex. nuts, ½ in. or under	85, 10 & 10% off
Semi-fin. hex. nuts, ⅝ in. and larger	85 & 5% off
Rivets, 7/16 x 6½, smaller & shorter	80, 10 & 5% off
Rivets, tin plated, packages	80, 10 and 5% off
Rivets, metallic tinned, packages	80, 10 and 5% off
Standard cap screws	70, 10 and 10% off
Standard set-screws	75, 10 and 10% off

Shafting.—Automobile builders are taking out their contracts for shafting at a fair rate, but specifications from other consumers are slow. The new demand is dull and only for small lots. We quote cold-rolled shafting at 66 per cent. off in carloads, delivered in base territory, but this price is likely to be shaded one point if any desirable business was coming out.

Hoops and Bands.—The cooperage plants are expected to specify more freely for hoops in the near future, but present demand is light. We quote steel bands at 1.20c., with extras as per the steel bar card, and steel hoops at 1.30c., f.o.b. Pittsburgh, for delivery over remainder of the year.

Railroad Spikes.—One local plant has been idle for about three weeks for lack of orders, while other makers are running to 50 per cent. or less. There is no new demand and specifications are dull. We quote standard sizes of railroad and boat spikes at $1.40 and small railroad and boat spikes at $1.50 per 100 lb. in carload lots, f.o.b. Pittsburgh.

Merchant Steel.—Shipments by the mills in September have been lighter than in August. New orders are only for small lots. Some shipments of high grade tool steels which were held up on account of the war are now being gotten ready and will go out in a short time. Prices are less shaded, but on small lots are about as follows: Iron finished tire, ½ x 1½ in. and larger, 1.30c., base; under ½ x 1½ in., 1.45c.; planished tire, 1.50c.; channel tire, ¾ to ⅞ and 1 in., 1.80c. to 1.90c.; 1⅛ in. and larger, 1.90c.; toe calk, 1.90c. to 2c., base; flat sleigh shoe, 1.65c.; concave and convex, 1.70c.; cutter shoe, tapered or bent, 2.20c. to 2.30c.; spring steel, 1.90c. to 2c.; machinery steel, smooth finish, 1.70c. We quote cold-rolled strip steel as follows: Base rates for 1 in. and 1½ in. and wider, under 0.20 carbon, and No. 10 and heavier, hard temper, 3.25c.; soft, 3.50c.; coils, hard, 3.15c.; soft, 3.40c.; freight allowed. The usual differentials apply for lighter sizes.

Standard Pipe.—Makers report little new demand for pipe, and there is no business offering in oil-well supplies. This is the dullest period the pipe trade has known in some years. The output is not more than 25 to 30 per cent. of capacity, if that much. Discounts on iron and steel pipe are being firmly held on the small amount of new business that is being placed.

Boiler Tubes.—The new demand for locomotive and merchant tubes is dull, and none of the tube mills is running to more than 25 to 35 per cent. of capacity. Regular discounts are not observed, prices being freely shaded.

Coke.—No inquiries are in the market for blast-furnace coke, and the market is stagnant. Some low prices have lately been made on furnace coke loaded on cars, $1.60 having been materially shaded. We quote best grades of blast furnace coke for prompt shipment at $1.60, and on contracts for remainder of the year, in which there is nothing doing, at about $1.75 per net ton at oven. Standard 72-hour foundry coke can be bought at $2 per net ton or less for prompt shipment. The output of coke in the upper and lower Connellsville regions last week, as reported by the Connellsville Courier, was 243,695 net tons, a decrease over the previous week of more than 7000 tons.

Old Material.—The local scrap market continues very dull. Some grades, such as busheling scrap, have gone off slightly in price. Bundled sheet scrap is reported a little stronger, while cast-iron borings are now held at about $8.50 minimum. A local dealer reports a sale of 300 tons at this price. So little scrap is selling that it is difficult to quote the market, and dealers are not willing to sell short. For delivery to consumers' mills in the Pittsburgh and nearby districts, that take the same rates of freight, prices are about as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh delivery	$11.00 to $11.25
Compressed side and end sheet scrap	10.00 to 10.25
No. 1 foundry cast	11.50 to 11.75
No. 2 foundry cast	10.25 to 10.50
Bundled sheet scrap, f.o.b. consumers' mills, Pittsburgh district	8.25 to 8.50
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	12.75 to 13.00
No. 1 railroad malleable stock	11.00 to 11.25
Railroad grate bars	10.25 to 10.50
Low phosphorus melting stock	14.25 to 14.50
Iron car axles	19.00 to 19.50
Steel car axles	13.50 to 14.00
Locomotive axles, steel	20.00 to 20.50
No. 1 busheling scrap	10.50 to 10.75
No. 2 busheling scrap	6.75 to 7.00
Machine shop turnings	7.75 to 8.00
Old carwheels	11.25 to 11.50
Cast-iron borings	8.50
†Sheet bar crop ends	12.00 to 12.25
Old iron rails	13.00 to 13.25
No. 1 railroad wrought scrap	11.50 to 11.75
Heavy steel axle turnings	8.50 to 8.75
Heavy breakable cast scrap	11.25 to 11.50

†Shipping point.

Chicago

CHICAGO, ILL., September 30, 1914.—(*By Wire.*)

Steel mill operation in the West has not been more seriously menaced by lack of orders in the past decade than at preesnt. The lull in building work requiring structural steel and the curtailment of railroad car buying, affecting the heavier products more particularly, have cut off much new business at the source and have tied up on the books of the mills no inconsiderable tonnage. While this scarcity of business has limited the pressure on prices, the mills have indicated an eagerness to take tonnages in shapes and plates at reductions of $1 and $2 from the 1.20c. Pittsburgh basis, and some sales have been made. The mill position as regards sheets and bars is not so seriously threatened, and rolling schedules are such as to obviate the need of immediate business. Offers of Bessemer steel bars at 1.15c. for next year have been made. The movement of pig iron is unimproved and the market is at a standstill. The new tariffs showing reduced rates to Chicago are the occasion of some confusion because of their apparent limited application. The marketing of old material was never more difficult. The very few sales to consumers offer only a nominal basis for quotations, while the general unwillingness to buy at any price suggests greater weakness in the market than is compatible with the real value of the material.

(*By Mail*)

Pig Iron.—From the standpoint of the producers, the market could hardly present a less favorable situation. There is a minimum of inquiry with a corresponding scarcity of sales; shipments due are far behind contract schedules and collections are reported as exceedingly tardy. The slightest variation in analysis from what is accepted as standard grading is sufficient excuse for making concessions, and prices show a wide range of irregularity. This is particularly true of the Northern brands of iron. While all of the Southern makers are not willing to sell on the basis of $10, Birmingham, there is practically no iron bought from the South under the present circumstances for which more than that price is paid. Concern regarding the delivery of ferromanganese seems almost to have disappeared, although there remain those who look with apprehension upon the continuance of the war as a menace to future supply. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic iron, which are f.o.b. furnace and do not include a local switching charge averaging 50c. a ton:

Lake Superior charcoal	$15.75 to $16.75
Northern coke foundry, No. 1	13.50 to 14.00
Northern coke foundry, No. 2	13.00 to 13.50
Northern coke foundry, No. 3	12.75 to 13.25
Southern coke, No. 1 f'dry and 1 soft	14.85 to 15.10
Southern coke, No. 2 f'dry and 2 soft	14.35 to 14.60
Malleable Bessemer	13.00 to 13.50
Standard Bessemer	17.00
Basic	12.75 to 13.25
Low phosphorus	21.00 to 21.75
Jackson Co. and Ky. silvery, 6 per cent.	16.90 to 17.40
Jackson Co. and Ky. silvery, 8 per cent.	17.90 to 18.40
Jackson Co. and Ky. sil'vy, 10 per cent.	18.90 to 19.40

Rails and Track Supplies.—There have been few periods in which the railroads have bought so little as at present. Where rail purchases by the largest roads are ordinarily in round numbers some lots were placed last week in which exact tonnages were specified, some of the most important roads taking only a few hundred tons. We quote standard railroad spikes at 1.50c. to 1.60c., base; track bolts with square nuts, 1.90c. to 2c., base, all in carload lots, Chicago; tie plates, $25.50 to $26, f.o.b. mill, net ton; standard section Bessemer rails, Chicago, 1.25c., base; open hearth, 1.34c.; light rails, 25 to 45 lb., 1.25c.; 16 to 20 lb., 1.30c.; 12 lb., 1.35c.; 8 lb., 1.40c.; angle bars, 1.50c., Chicago.

Structural Material.—The operating outlook for a considerable number of steel mills is a matter of grave concern and will continue so as long as steel building construction and car building are as limited as at present. The 24-in. mill of the Inland Steel Company has been shut down for the first time in seven years, due not only to the general lack of business but more particularly to the holding up of between 15,000 and 20,000 tons of structural material which has been on the books. Contracts for fabricated steel reported as placed last week include 2200 tons for the Western Sugar Refining Company, San Francisco, Cal., to Dyer Brothers; 138 tons for the State Hospital at Dunning to A. Bolter's Sons; 703 tons for a union station at Denver and 465 tons for a Chicago & Western Indiana Railway bridge, to the American Bridge Company. The Illinois Steel Company will also furnish for the hospital at Dunning in this city 167 tons of material. A contract for 252 tons for a dam at Cedar Rapids, Iowa, has been placed. While the great scarcity of business minimizes the importance of price, the fact remains that the mills are now too eager for business to stand with much firmness on the 1.20c. Pittsburgh basis for quotations. At Chicago 1.33c. has been done and there is no question as to the willingness of the mills to do even less if by so doing desirable tonnages could be booked. We quote for Chicago delivery of plain shapes from mill 1.30c. to 1.38c.

The buying of steel from store has paralleled the decline in the volume of mill delivery purchases and lacks features of particular interest. We quote for Chicago delivery of shapes out of stock 1.75c.

Plates.—Unless other sources of business in plates develop promptly, the next fortnight will witness an increased if not complete idleness of some of the local plate-mill capacity. Car builders are facing postponed delivery instructions from the railroads and they in turn are withholding specifications from the plate mills. A considerable tonnage in this district is involved in such delays, and the miscellaneous plate business on which the local mills are now largely depending is hardly sufficient to keep them in operation. Plate quotations indicate the eagerness with which mills contemplate prospective business. We quote for Chicago delivery of plates from mill 1.30c. to 1.38c.

We quote for delivery of plates out of stock 1.75c., Chicago.

Sheets.—Sheet business proceeds on a more encouraging plane of activity. A local producer has order bookings to run through the coming six or seven weeks. The concessions of $2 a ton to which attention has already been called do not appear to have become more aggravated and in fact are not being made by all of the producing interests. We quote for Chicago delivery from mill: No. 10 blue annealed, 1.58c.; No. 28 black, 2.08c. to 2.13c.; No. 28 galvanized, 3.08c. to 3.13c.

We quote for Chicago delivery from jobbers' stock as follows, minimum prices applying on bundles of 25 or more: No. 10 blue annealed, 1.95c.; No. 28 black, 2.55c.; No. 28 galvanized, 3.55c.

Bars.—Specifications against steel-bar contracts offer no special occasion for complaint, although the middle of October is about as far ahead as any of the mills are now secured in their orders. Nor is there any general departure from the price of 1.38c., Chicago, although one steel company associated with an agricultural implement manufacturer has quoted 1.15c., Pittsburgh, for Bessemer bars for delivery through the first quarter. There is very little bar-iron buying. We quote for mill shipments as follows: Bar iron, 1.05c. to 1.10c.; soft steel bars, 1.38c.; hard steel bars, 1.25c. to 1.30c.; shafting in carloads, 65 per cent. off; less than carloads, 60 per cent. off.

We quote store prices for Chicago delivery: Soft steel bars, 1.65c.; bar iron, 1.65c.; reinforcing bars, 1.65c. base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting 60 per cent. off.

Rivets and Bolts.—Local makers of rivets report specifications booked for from two to four weeks ahead but with an increasingly unpromising outlook for continued buying. The demand for bolts and nuts is exceedingly limited. We continue to quote from mill as follows: Carriage bolts up to ⅜ x 6 in., rolled thread, 85; cut thread, 80-5; larger sizes, 80; machine bolts up to ¾ x 4 in., rolled thread, 85-5; cut thread, 85; larger sizes, 80-5; coach screws, 85-10; hot pressed nuts, square head, $6.60 off per cwt.; hexagon, $7.60 off per cwt. Structural rivets, ½ to ¼ in., 1.58c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

We quote out of store: Structural rivets, 2.20c.; boiler rivets, 2.30c.; machine bolts up to ⅞ x 4 in., 75-15; larger sizes, 70-10-10; carriage bolts up to ⅞ x 6 in., 75-10; larger sizes, 70-15 off; hot pressed nuts, square head, $6, and hexagon, $6.70 off per cwt.

Wire Products.—Some stress is being laid upon shipments of wire, particularly barb wire to Europe, but demand from domestic consumers was lighter during the week. As is to be expected, the South has fallen behind sharply in the volume of its fall requirements. The wire trade, however, ranks with bars and sheets among the finished steel products in the matter of general activity. We quote to jobbers as follows: Plain wire, No. 9 and coarser, base, $1.58; wire nails, $1.78; painted barb wire, $1.78; galvanized, $2.18; polished staples, $1.78; galvanized, $2.18, all Chicago.

Old Material.—The predominant fact in the current scrap market is the unwillingness of consumers to purchase, regardless of price. Sales are so few as to make the actual value of material decidedly uncertain. Stocks have accumulated everywhere and nearly all grades of material are showing a decline in value as the result of the prolonged stagnation. It is understood that, despite the market situation and the fact that the number of bidders is greatly reduced, practically all of recent railroad lists have been sold. Further offerings include 3000 tons from the Rock Island, 4200 tons from the Burlington, 2000 tons from the Lake Shore and an exceedingly large list from the Baltimore & Ohio. A large portion of this latter offering is available in the hands of the railroads for almost immediate delivery, which fact is likely to add to the difficulties of absorbing this further material. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton	
Old iron rails	$11.25 to	$11.75
Old steel rails, rerolling	10.25 to	10.50
Old steel rails, less than 3 ft	10.00 to	10.50
Old carwheels	10.75 to	11.25
Heavy melting steel scrap	8.50 to	9.00
Frogs, switches and guards, cut apart	9.00 to	9.25
Shoveling steel	8.00 to	8.50
Steel axle turnings	6.50 to	7.00
	Per Net Ton	
Iron angles and splice bars	$11.25 to	$11.75
Iron arch bars and transoms	11.25 to	11.75
Steel angle bars	8.25 to	8.75
Iron car axles	14.50 to	15.00
Steel car axles	11.00 to	11.50
No. 1 railroad wrought	8.00 to	8.25
No. 2 railroad wrought	7.50 to	7.75
Cut forge	7.50 to	7.75
Steel knuckles and couplers	8.75 to	9.25
Steel springs	9.00 to	9.50
Locomotive tires, smooth	8.75 to	9.25
Machine shop turnings	4.50 to	4.75
Cast borings	4.75 to	5.00
No. 1 busheling	6.75 to	7.00
No. 2 busheling	5.25 to	5.50
No. 1 boilers, cut to sheets and rings	6.00 to	6.25
Boiler punchings	9.25 to	9.75
No. 1 cast scrap	9.00 to	9.25
Stove plate and light cast scrap	8.25 to	8.50
Grate bars	7.75 to	8.25
Railroad malleable	8.00 to	8.25
Agricultural malleable	7.50 to	7.75
Pipes and flues	5.50 to	6.00

Cast-Iron Pipe.—The award of the contract for pipe at Casper, Wyo., the placing of which has been anticipated for some months, now specifies steel instead of cast-iron pipe. The city of Toledo has not yet succeeded in renewing its financial arrangements and its purchase of pipe is consequently still held in abeyance. Routine orders the past week have been of little consequence. We quote as follows, per net ton, Chicago: Water pipe, 4 in., $26; 6 to 12 in., $24; 16 in. and up, $23.50, with $1 extra for gas pipe.

Philadelphia

PHILADELPHIA, PA., September 29, 1914.

Much effort is being expended in the attempt to fathom the causes of the extreme quiet which is being felt in all lines, but the discussions of diminished exports, dull domestic demand and scarce money do not lead anywhere. A few thousand tons of bars and rods have been sold for export and there are definite reports of the purchase of at least 2200 tons of billets to be rolled into products for foreign consumption. Much talk is heard of activity in supplying various requirements, such as horseshoes, armored automobiles, automobile trucks and shovels to the French and Russian armies, but the reported sellers are not discussing the subject openly and whatever may have been done it has not yet had any broad effect in bettering trade. In pig iron only negative news is found. Some weakness is indicated in plates, but bars and shapes appear to be held at 1.35c., Philadelphia. The demand for sheets continues a good feature. Old materials are quiet and dull.

Iron Ore.—The only notable arrival of the week ended September 26 was 13,080 tons from Cuba. A steamer is due here this week with 7000 tons of manganese ore from Bombay, India. Two cargoes of manganese ore from Russia, previously referred to, are now at Baltimore.

Pig Iron.—No sales worthy of individual mention are reported and there has been a sharp falling off in the aggregate of small transactions which gave the trade something to think about and furnished employment for clerical forces. That business is flat or that there is none worth talking about is heard on all sides.

The operation of foundries in eastern Pennsylvania is irregular, some of them running but two heats a week while others are operating five or six days. When buying of iron is resumed in any force it will be for first-quarter delivery. Notwithstanding the general dullness, there have been a few small sales of standard low phosphorus, the demand for which has kept up surprisingly well in recent weeks. From England there is a new inquiry for from 500 to 1000 tons of low phosphorus. A producer of Virginia iron sold 960 tons in the week and considers that he did well. The local customs house records the arrival at this port last week of 500 tons of iron which probably was special in character. About 3000 tons of Wabana iron arrived here from Nova Scotia last week. The shipment is said to be the last immediately in prospect. Quotations are as follows for standard brands for early delivery in buyers' yards in this district:

Eastern Penna. No. 2 X foundry	$14.75 to $15.00
Eastern Penna. No. 2 plain	14.50 to 14.75
Virginia No. 2 X foundry	15.30 to 15.50
Virginia No. 2 plain	15.05 to 15.25
Gray forge	13.75 to 14.00
Basic	14.00
Standard low phosphorus	21.00 to 21.50

Ferroalloys.—Consumers are showing little or no interest in ferromanganese. That resale lots of 80 per cent. have been offered at $75 seaboard is generally admitted by dealers, but in the absence of demand they continue to name $80. The quotation for 50 per cent. ferrosilicon is unchanged at $71 to $73, Pittsburgh.

Bars.—The local branch of a prominent maker had a comparatively good week, having booked orders for about 500 tons of steel bars and having about 800 tons specified. While this company did no export business in bars, another maker sold several thousand tons of bars and rods for foreign shipment. The quotation for delivery this year is unchanged at 1.35c., Philadelphia. Iron bars are quiet at about 1.12c., Philadelphia.

Plates.—The demand continues unsatisfactory and almost entirely made up of small requirements. A few instances are heard where inquirers have said they could get a lower price than 1.35c., Philadelphia, and the business in question, said to involve from 1000 to 2000 tons, was not placed with makers who quoted on the 1.20c. Pittsburgh basis. The New York Shipbuilding Company has received an order for a tank steamer for the Gulf Refining Company which will require a good tonnage of plates. The vessel, which is similar to two others that the company recently finished, is 392 ft. in length and of 7500 tons dead weight and will require about 3500 tons of plates and shapes. None of the foreign inquiry has yet resulted in sales.

Structural Material.—New business continues extremely light, although orders booked will keep the mills running at a fair rate for a few weeks. There is not enough inquiry to indicate any recession from 1.35c., Philadelphia. It is believed that the mills have not booked this month more than 30 per cent. of their capacity. The Southern Railway has bids in hand for 500 tons of bridge material and revised bids are also under consideration for about 500 tons required by the Allentown high school, for which George H. Hardner, of that city, has the general contract.

Billets.—Local makers are operating at less than 50 per cent. of capacity. As yet, the inquiry from abroad has not resulted in any direct business, one of the difficulties being adjustments of ocean freights, which are not stable, especially where future delivery is concerned. Indirectly some billet makers have profited by foreign demand, for instance, where 2000 tons were sold to be rolled into products for shipment to Japan and again where 200 tons were sold to supply material for horse shoes to be exported. Quotations are unchanged at $23.40 for open-hearth rolling billets, with forging steel $4 to $5 per ton higher.

Sheets.—Orders and specifications continue to come along in volume relatively better than for other products. Quotations are 1.60c. to 1.65c., Philadelphia, for No. 10 blue annealed.

Coke.—Except for an occasional carload, no activity exists. Prompt furnace coke is quoted at $1.70 to $1.75 per net ton at oven and prompt foundry at $2.25 to $2.35. Freight rates to this city from the principal producing districts are as follows: Connellsville, $2.05; Latrobe, $1.85, and Mountain, $1.65.

Old Material.—There is but little buying or inquiry. Prices are weaker all along the line and it is not felt that there will be any tendency to advance in the next 30 days. Quotations for delivery in buyers' yards in this district, covering eastern Pennsylvania and taking freight rates from 35c. to $1.35 per gross ton, are as follows:

No. 1 heavy melting steel	$10.50 to $10.75
Old steel rails, rerolling	12.00 to 12.50
Low phosphorus heavy melting steel scrap	14.00 to 14.50
Old steel axles	14.50 to 15.00
Old iron axles (nominal)	18.00 to 18.50
Old iron rails	14.00 to 14.50
Old carwheels	11.00 to 11.50
No. 1 railroad wrought	12.00 to 12.50
Wrought-iron pipe	10.00 to 10.50
No. 1 forge fire	8.50 to 9.00
Bundled sheets	8.50 to 9.00
No. 2 light iron	5.00 to 5.50
No. 2 busheling	8.00 to 8.50
Machine shop turnings	8.25 to 8.50
Cast borings	8.50 to 8.75
No. 1 cast	12.00 to 12.50
Grate bars, railroad	8.00 to 8.50
Stove plate	8.50 to 9.00
Railroad malleable	9.00 to 9.50

Buffalo

BUFFALO, N. Y., September 29, 1914.

Pig Iron.—Very little new business has been booked. In fact, furnacemen report that it has been the leanest week in the history of this district. Shipments on contracts are going out pretty well, but there are a few instances where contract quotas could not be fully assimilated. Melters have apparently contracted for the full complement of their requirements for some time ahead. Foundries which manufacture special commodities now in demand are running full, but the majority are running on curtailed time, a small number only two or three days a week and a few down altogether for a temporary period. Three of the merchant stacks of the district are out of blast. The small inquiry permits of only an approximation toward quotations, but if business were offered it could probably be placed at about the following ranges for last half delivery, f.o.b. furnace:

No. 1 foundry	$13.00 to $13.50
No. 2 X foundry	12.75 to 13.25
No. 2 plain	12.75 to 13.00
No. 3 foundry	12.75
Gray forge	12.50 to 12.75
Malleable	12.75 to 13.25
Basic	13.50 to 14.00
Charcoal, regular brands and analysis	16.25 to 17.25
Charcoal, special brands and analysis	20.50

Old Material.—Demand is very slack in all lines with the exception of turnings and borings. These two commodities are moving to the extent that stock is obtainable from producers and the aggregate tonnage of such product is small. Prices are unchanged from last report; dealers' selling prices per gross ton, f.o.b. Buffalo, being as follows:

Heavy melting steel	$10.25 to $10.50
Low phosphorus steel	14.00 to 14.50
Boiler plate sheared	11.50 to 12.00
No. 1 railroad wrought scrap	10.00 to 10.50
No. 1 railroad and machinery cast	10.25 to 10.75
Old steel axles	12.00 to 12.50
Old iron axles	17.50 to 18.00
Old carwheels	10.50 to 11.00
Railroad malleable	9.00 to 9.50
Machine shop turnings	5.50 to 6.00
Heavy axle turnings	7.50 to 8.25
Clean cast borings	6.00 to 6.50
Old iron rails	12.25 to 12.75
Locomotive grate bars	9.00 to 9.50
Stove plate (net ton)	9.00 to 9.75
Wrought pipe	7.50 to 8.00
Bundled sheet scrap	6.25 to 6.50
No. 1 busheling scrap	8.25 to 8.75
No. 2 busheling scrap	5.75 to 6.25
Bundled tin scrap	10.50

Finished Iron and Steel.—Specifications on contracts continue to come in freely because of the expiration of current quarter contracts, but diminishing activity is noted in new business as compared with a week or two ago. The leading interest and the large independent

interests are adhering firmly to schedules prevailing for the past month, 1.20c. Pittsburgh, for bars, plates and shapes. The Canadian inquiry for materials for export to England, mentioned last week, continues, but very little actual business has resulted. Business in skelp and bar products for Canadian consumption is slow. Bids are soon to be taken for 100 tons for the Grand Trunk passenger and freight station at the International Bridge entrance, Buffalo, and for 100 tons for the A. W. Ott Mfg. Company, Rochester.

Cincinnati

CINCINNATI, OHIO, September 30, 1914.—(*By Wire.*)

Pig Iron.—The principal topic under discussion by pig-iron merchants and consumers is the rate reduction on Southern pig iron to various points. The Interstate Commerce Commission's ruling clearly indicated that the reduction of 35c. per ton is only applicable on the railroad lines enumerated in the new tariff supplement issued. As only two Northern railroads in this immediate territory are named in the well-known Sloss-Sheffield case, there is considerable confusion as to the delivered cost of Southern iron to many consumers in this immediate vicinity. For instance, while Oakley, Ohio, is now a part of Cincinnati, the old rate of $3.25 from Birmingham will apply on shipments to that point until the commission makes a new ruling. Other nearby points are likewise affected, and should complaints be made by Southern furnace operators no change can be made until opposing parties have been given an opportunity to present their case. This will obviously mean a delay of several weeks, at the least, and in the meantime many vexing freight claims from both buyers and sellers will be filed with different transportation lines. Undoubtedly there will arise disputes between iron merchants and their customers, but the former are assisting in clarifying the situation. At the moment the pig-iron business is almost at a standstill, with only a few purchases of foundry iron being made. A basic consumer has quietly covered for a portion of first-quarter requirements, but no information as to the price can be obtained. This deal is understood to have been made some time ago. No open prices are out for iron to be shipped next year, and if any quotations are made they are doubtless too high to interest prospective buyers. The market is a waiting one, with no desire on the part of either buyer or seller to force the issue at the present time. We are quoting Cincinnati prices on Southern iron based on the existing freight rate from Birmingham, but after October 1 the rate to Cincinnati proper will be $2.90. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 f'dry and 1 soft.	$13.75 to $14.25
Southern coke, No. 2 f'dry and 2 soft.	13.25 to 13.75
Southern coke, No. 3 foundry	12.75 to 13.25
Southern No. 4 foundry	12.25 to 12.75
Southern gray forge	11.75 to 12.25
Ohio silvery, 8 per cent. silicon	17.20 to 17.70
Southern Ohio coke, No. 1	15.20 to 15.70
Southern Ohio coke, No. 2	14.20 to 14.70
Southern Ohio coke, No. 3	13.95 to 14.20
Southern Ohio malleable Bessemer	14.20
Basic, Northern	14.45 to 14.95
Lake Superior charcoal	15.25 to 17.25
Standard Southern carwheel	27.25 to 27.75

(*By Mail*)

Coke.—Curtailment in production has cut down the supply of both furnace and foundry coke to the present rate of consumption. As a consequence, prices remain at the same level as reported last week. We quote 48-hr. coke in all three districts at $1.75 to $2 per net ton at oven, and 72-hr. brands around $2.25 to $2.60.

Finished Material.—Local store business for September will not equal last year's record for the same month. October, however, is expected to make a much better showing. One encouraging feature is the prompt liquidation of accounts reported by several firms. There is no call for heavy structural material, but light structural shapes are in better demand. The sheet mills in this territory are apparently content to fill new orders that are being received for immediate shipment, and to take care of specifications on old contracts. We quote No. 28 black sheets at 2.15c., Cincinnati, or Newport, Ky., and No. 28 galvanized at 3.15c. Steel bars and light structural shapes, from stock, are quoted around 1.80c. to 1.85c.

Old Material.—The market is very dull. A few small lots of scrap iron have been sold to the foundries, but there are no large contracts to report from either the buying or selling end. The large stocks on hand, together with the low price on pig iron, tend to keep quotations at a low level. The minimum figures given below represent what buyers are willing to pay for delivery in their yards, southern Ohio and Cincinnati, and the maximum quotations are dealers' prices, f.o.b. at yards:

Per Gross Ton

Bundled sheet scrap	$6.25 to $6.75
Old iron rails	11.00 to 11.50
Relaying rails, 50 lb. and up	19.75 to 20.25
Rerolling steel rails	10.00 to 10.50
Melting steel rails	8.75 to 9.25
Old carwheels	9.75 to 10.25

Per Net Ton

No. 1 railroad wrought	$8.00 to $8.50
Cast borings	4.00 to 4.50
Steel turnings	4.00 to 4.50
Railroad cast scrap	9.25 to 9.75
No. 1 machinery cast scrap	10.00 to 10.25
Burnt scrap	6.00 to 6.50
Old iron axles	14.50 to 15.00
Locomotive tires (smooth inside)	9.25 to 9.75
Pipes and flues	6.00 to 6.50
Malleable and steel scrap	7.00 to 7.25
Railroad tank and sheet scrap	5.00 to 5.50

Cleveland

CLEVELAND, OHIO, September 29, 1914.

Iron Ore.—No further sales of ore are reported and sellers do not look for any additional business this season. The ore shipping season will close unusually early. Some of the shippers will be through October 15, and others will ship some ore until November 1. However, October shipments will be very light and very few cargoes will be moved in November. We quote prices as follows: Old range Bessemer, $3.75; Mesaba Bessemer, $3.50; old range non-Bessemer, $3.00; Mesaba non-Bessemer, $2.85.

Pig Iron.—Aside from an occasional sale of foundry iron in lots of 100 tons down to carloads, the market is lifeless. Most consumers are covered for the fourth quarter and are taking their iron fairly well on contracts, although some shipments are being held up. A few jobbing foundries report some improvement in business. Most foundries are running from 40 to 50 per cent. of capacity. Southern iron is generally quoted at $10.25, Birmingham, but there is some Tennessee iron on the market at $10 and a round lot inquiry would probably bring out a $10 price from Alabama furnaces. We have reduced our prices on Southern iron for Cleveland delivery 35c. a ton, because of the 35c. reduction in freight rates on Southern pig iron for points north of the Ohio River, in effect October 1. We quote, delivered Cleveland, as follows:

Bessemer	$14.90
Basic	$13.75 to 13.90
Northern No. 2 foundry	13.75
Southern No. 2 foundry	14.00 to 14.25
Gray forge	13.25
Jackson Co. silvery, 8 per cent. silicon	17.55
Standard low phosphorus, Valley furnace	20.50

Coke.—Furnace coke prices are weak. A local furnace interest reports the purchase of several thousand tons of standard furnace coke for spot shipment at 1.50c. per net ton at oven. The general asking price is 1.65c. for October shipment and 1.75c. for the last quarter. Foundry coke is very quiet, the only sales being small lots. We quote standard Connellsville foundry coke at $2.25 to $2.50 per net ton at oven.

Finished Iron and Steel.—Some selling agencies report a slight improvement and there was a better volume of warehouse business. September sales show a considerable falling off as compared with August. A number of inquiries for steel bar contracts for the first quarter and first half have come out. One Cleveland consumer has contracted for about 7000 tons for that delivery, and it is probable that a fair tonnage could be booked in contracts were the mills willing to go to

the current price of 1.20c. The leading interest is declining to sell for delivery after January 1. Last June when the implement makers were in the market a few succeeded in securing contracts for delivery beyond January 1 at higher prices for that delivery, these being on the basis of 1.25c. for the first quarter and 1.30c. for the second quarter. Bar iron is in very light demand and weak, competition for the small amount of business having brought out lower prices than have prevailed recently. Chicago mills are selling bar iron at 1.05c. in the Ohio territory, but some business has been taken at a lower price. Iron bars are generally quoted at 1.20c. for Cleveland delivery. Both of the local iron mills are shut down this week. In structural lines bids have been taken for 1400 tons for a new building for the Warren City Tank & Boiler Company, Warren, and 700 tons for the Ames Building in Cleveland. The Massillon Bridge & Structural Company has taken 500 tons for an office building in Akron. There is little new demand for reinforcing bars, the only new inquiry pending being for 175 tons for a water works pumping station in Cleveland. Steel bars and structural material are firm at 1.20c., but some shading on plates is reported by smaller mills. Conditions in the sheet trade appear quite satisfactory. While not much new business is coming out, mills are fairly well filled with orders and are generally adhering to 2c. for No. 28 black, 3c. for No. 28 galvanized, and 1.45c. to 1.50c. for No. 10 blue annealed, for delivery during the last quarter. These prices, however, are being shaded $1 and $2 a ton by jobbers, and possibly by some of the mills for prompt shipment. Stock prices are 1.80c. for steel bars and 1.90c. for plates and structural material.

Bolts, Nuts and Rivets.—There is little new demand for bolts and nuts and specifications on contracts are light. While prices are fairly well maintained some shading is reported. Rivet specifications are light. Prices are unchanged at 1.50c. for structural and 1.60c. for boiler. We quote discounts as follows: Common carriage bolts, ⅜ x 6 in., smaller or shorter, rolled thread, 80 and 20 per cent.; cut thread, 80 and 15 per cent.; larger or longer, 75 and 15 per cent.; machine bolts with h. p. nuts, ⅜ x 4 in., smaller or shorter, rolled thread, 80 and 25 per cent.; cut thread, 80 and 20 per cent.; larger or longer, 80 per cent.; coach and lag screws, 80 and 25 per cent.; square h. p. nuts, blank or tapped, $6.30 off; hexagon h. p. nuts, blank or tapped, $7.20 off; c. p. c. and t. square nuts, blank or tapped, $6 off; hexagon, ⅝ in. and larger, $7.20 off; 9/16 in. and smaller, $7.80 off; semi-finished hexagon nuts, ⅝ in. and larger, 85, 10 and 5 per cent.; 9/16 in. and smaller, 85, 10, 10 and 5 per cent.

Old Material.—Prices are weak and the market shows little activity. Yard stocks are large and a great deal of scrap is being offered at current prices. The minimum quotation on heavy steel scrap in Cleveland has declined 50c. a ton to $9.50. The sale of a small lot is reported at $9.65. Quotations on heavy steel in the Valley are lower, some of the mills now offering only $10.50. A Canton consumer is understood to have bought about 1400 tons for October delivery at that price. Steel car axles are particularly weak and have declined 75c. a ton. Cast scrap is 25c. a ton lower. There is very little demand for this grade and dealers report that it is being freely offered to them at $10. Dealers' prices, f.o.b. Cleveland, are as follows:

Per Gross Ton

Old steel rails, rerolling	$11.50 to $12.00
Old iron rails	12.50 to 13.00
Steel car axles	13.25 to 13.75
Heavy melting steel	9.50 to 10.25
Old carwheels	10.75 to 11.00
Relaying rails, 50 lb. and over	23.00 to 25.00
Agricultural malleable	8.50 to 9.00
Railroad malleable	10.25 to 10.50
Light bundled sheet scrap	7.50 to 8.00

Per Net Ton

Iron car axles	$17.00 to $17.25
Cast borings	5.75 to 6.00
Iron and steel turnings and drillings	5.25 to 5.50
Steel axle turnings	6.75 to 7.25
No. 1 busheling, new	8.25 to 8.50
No. 1 busheling, old	8.25
No. 1 railroad wrought	9.50 to 10.00
No. 1 cast	10.25 to 10.50
Stove plate	7.50 to 8.00

Birmingham

BIRMINGHAM, ALA., September 28, 1914.

Pig Iron.—Local iron operators are more interested in getting into shape the new and reduced rates to competitive territory than in prices. The rates will go into effect by order of the Interstate Commerce Commission October 1 and the railroad systems mentioned as defendants in the complaint of the iron manufacturers have given notice of compliance. However, several systems in the Central Traffic Association and in fact practically all roads not named in the complaint, have declined to grant the decreases. The complaining iron men have taken steps to have the order formally extended to these non-complying lines, while the latter will probably contend that, not being named in the complaint, they cannot be affected. Iron men say this position is purely technical and untenable. Meanwhile there has been a good deal of trouble experienced in rerouting, etc. The most seriously affected parties are consumers whose plants are immediately adjacent to territory where the lower rates apply, while, being on other systems, they have been refused them. Some large factories are only a few miles from such points. Some of the railroads ordered by the commission to put the reduced rate in effect have also notified the commission of the action of the non-compliant and, for the nonce, are on the same side as the iron manufacturers. Sales are scattered. One interest, however, has sold one-half its make, or 15,000 tons, this month. Others report very little business. The usual basis continues to be $10.25, but the volume moving is not heavy enough to make a real market. Some mottled sold on a $10.50 basis. There has been practically no inquiry for 1915.

We quote, per gross ton, f.o.b. Birmingham, as follows:

No. 1 foundry and soft	$10.50 to $11.00
No. 2 foundry and soft	10.00 to 10.50
No. 3 foundry	9.50 to 10.00
No. 4 foundry	9.25 to 9.75
Gray forge	9.00 to 9.50
Basic	10.00 to 10.25
Charcoal	23.50 to 24.00

Cast-Iron Pipe.—Manufacturers of the larger sizes of pipe have received a number of quite good orders and operations are on a considerable scale, but prices have been shaved in most of the recently acquired business, notably on a Baltimore and a Mississippi contract. Sanitary pipe makers, always working on a reduced scale at this season, report operations below normal for the period. The new Superior pipe plant at Bessemer is on full turn. We quote, per net ton; f.o.b., pipe works, as follows: 4-in., $20; 6-in. and upward, $18, with $1 added for gas pipe.

Coal and Coke.—Some of the larger steam coal operators are running their mines two days per week, others three, the latter being the general maximum. Domestic mines are busy stocking yards for the winter. Neither export nor bunker trade has shown any life. Coke is finding a ready market at unchanged prices, the reduced output being well taken care of. We quote, per net ton, f.o.b. oven, as follows: Furnace coke, $2.75 to $3; foundry, $3.25 to $3.65.

Old Material.—General dullness exists in the scrap trade. Lighter grades are finding a comparatively good market, but otherwise little is being done and dealers are not inclined to take on stocks. Nominal quotations, per net ton, f.o.b. dealers' yards, are as follows:

Old iron axles	$14.50 to $15.00
Old steel axles	14.50 to 15.00
Old iron rails	13.00 to 13.50
No. 1 railroad wrought	10.00 to 11.00
No. 2 railroad wrought	8.50 to 9.00
No. 1 country wrought	9.00 to 10.00
No. 2 country wrought	8.00 to 9.00
No. 1 machinery cast	9.50 to 10.00
No. 1 steel scrap	8.00 to 8.50
Tram carwheels	9.50 to 10.00
Standard carwheels	10.50 to 11.00
Stove plate	8.00 to 8.50

The New Jersey Zinc Company has put in blast its No. 1 furnace at Palmerton, Pa., making both stacks active. The company's output of spiegeleisen is well sold ahead.

St. Louis

ST. LOUIS, MO., September 28, 1914.

The new rates on pig iron to the central west from Birmingham, Ala., go into effect October 1, but the tariffs which have been received in the St. Louis district have aroused some sharp criticism which pig iron users are threatening to take before the Interstate Commerce Commission. This is particularly true of the foundrymen in the Hannibal, Mo., and Quincy, Ill., districts and Iowa points as well as Missouri points other than St. Louis and St. Charles. None of these has been given any lower rate than existed before.

Pig Iron.—Demand continues in small lots for immediate or special needs and no contracts are reported for extended delivery or for large quantities. Foundries of this territory of any considerable size are known to be supplied with sufficient iron to render it unnecessary to enter the market in a large way for three to five months.

Coke.—Sales of coke have all been of carloads. The only transactions noted of consequence have been for domestic fuel. By-product coke continues to be quoted on a basis of Connellsville prices plus $2.80 freight.

Finished Iron and Steel.—Reports are that the aggregate orders for the month will compare favorably with those of last September, which, however, was a dull month for new business, though takings by specification under contracts were larger, probably, a year ago than they have been in the past month. There has been a little request for light rails from the coal interests and the lumber interests have bought none. The takings out of warehouse have been rather light, though not more so than in past weeks. For stock from warehouse we quote as follows: Soft steel bars, 1.70c.; structural steel, 1.80c.; tank plates, 1.80c.; No. 10 blue annealed sheets, 2c.; No. 28, black box annealed, cold rolled, 2.55c.; No. 28, galvanized sheets, black sheet gauge, 3.55c.

Old Material.—The scrap market is further depressed and all prices except those for relaying rails are off. Such transactions on railroad lists as have taken place have been at dealers' figures for laying down in yards against a rise later on. Mills show no disposition to take material, even that for which they have contracted. The only list out is one of 8000 tons from the Baltimore & Ohio and this will go, if at all, at lower figures than ever. We quote dealers' prices f.o.b. St. Louis as follows:

Per Gross Ton	
Old iron rails	$10.50 to $10.75
Old steel rails, rerolling	10.75 to 11.00
Old steel rails, less than 3 feet	10.00 to 10.25
Relaying rails, standard section, subject to inspection	21.00 to 23.00
Old carwheels	10.50 to 10.75
No. 1 railroad heavy melting steel scrap	9.50 to 9.75
Shoveling steel	7.50 to 7.75
Frogs, switches and guards cut apart	9.50 to 9.75
Bundled sheet scrap	4.50 to 4.75
Per Net Ton	
Iron angle bars	$9.50 to $10.00
Steel angle bars	8.25 to 8.50
Iron car axles	16.25 to 16.75
Steel car axles	11.25 to 11.75
Wrought arch bars and transoms	10.50 to 11.00
No. 1 railroad wrought	7.50 to 7.75
No. 2 railroad wrought	7.50 to 7.75
Railroad springs	8.75 to 9.00
Steel couplers and knuckles	8.25 to 8.50
Locomotive tires, 42 in. and over, smooth	8.25 to 8.75
No. 1 dealers' forge	7.25 to 7.50
Mixed borings	3.50 to 3.75
No. 1 busheling	6.75 to 7.00
No. 1 boilers, cut to sheets and rings	5.25 to 5.75
No. 1 cast scrap	9.00 to 9.50
Stove plate and light cast scrap	7.75 to 8.25
Railroad malleable	7.50 to 7.75
Agricultural malleable	7.00 to 7.50
Pipes and flues	5.25 to 5.75
Railroad sheet and tank scrap	5.25 to 5.50
Railroad grate bars	6.75 to 7.00
Machine shop turnings	4.50 to 4.75

Boston

BOSTON, MASS., September 29, 1914.

Old Material.—Business is very dull. The mills are doing no buying. Producers are not disposing of their scrap. Yet it is apparent that the trade has confidence in the not too distant future. Prices are unchanged. The quotations given below are based on prices offered by the large dealers to the producers and to the small dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points which take Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of $2.30 a ton is included. Mill prices are approximately 50c. per ton more than dealers' prices.

Heavy melting steel	$8.50 to $8.75
Low phosphorus steel	13.75 to 14.75
Old steel axles	13.25 to 13.75
Old iron axles	21.25 to 21.75
Mixed shafting	12.00 to 12.25
No. 1 wrought and soft steel	9.00 to 9.25
Skeleton (bundled)	5.50 to 5.75
Wrought-iron pipe	8.00 to 8.25
Cotton ties (bundled)	6.25 to 6.50
No. 2 light	3.75 to 4.25
Wrought turnings	5.00 to 5.50
Cast borings	5.25 to 5.75
Machinery cast	11.25 to 11.50
Malleable	8.00 to 8.25
Stove plate	7.75 to 8.00
Grate bars	5.25 to 5.50

San Francisco

SAN FRANCISCO, CAL., September 23, 1914.

Business continues in a highly abnormal and unsettled condition. The jobbing trade, except in galvanized sheets, is dull, the usual September revival in small consuming trades having failed to appear. Orders coming through the usual channels are light, while a few scattering inquiries of some importance are appearing in quarters where little was expected. The whole situation reflects the general readjustment which is now taking place, but which, local interests believe, will require the greater part of a year for completion. In most lines, including galvanized sheets, merchants are now generally figuring their cost on the basis of current Pittsburgh quotations plus freight through the Panama Canal.

Bars.—The jobbing movement in soft steel bars has improved slightly in some quarters, but is still considerably less than normal. Some of the leading merchants are fairly well supplied with foreign bars, but specifications on old contracts are coming out quite freely. There is practically nothing in the way of new business. Large deliveries are still being made on reinforcing bar contracts, but new inquiries of any consequence are scarce, and there is considerable competition between various mills in this district. Jobbing prices show irregularity.

Structural Material.—Structural business manifests more apparent activity than for several weeks, but there is nothing to indicate that the movement will be maintained, and most local shops are running on a small scale. The Western Sugar Refining Company entered the market suddenly for an addition to its plant, requiring nearly 2500 tons, mostly Bethlehem shapes, and placed the contract with Dyer Brothers. This shop also has a lot of small bridges, totaling several hundred tons, besides small building jobs at Grass Valley, Cal., Reno, Nev., and one in Alaska. The general contract for five Government buildings at Pearl Harbor, T. H., requiring 1200 tons of steel, has been placed with the Lord-Young Engineering Company. The Valley pipe line job will only take about 250 tons, and the award is not yet announced. Figures have just been taken for about 150 tons for a bridge at Hollister, Cal.

Rails.—Business in both light and standard rails is confined to small orders.

Plates.—Business is rather spotted and irregular, showing on the whole a gradual curtailment for several weeks. There was quite a heavy movement during the summer, with several oil companies as important factors in the market. Scattering orders from that source are still appearing, but the principal requirements have been covered, and business for pipe and penstock construction is closely limited. Marine work also is less active.

Sheets.—Blue annealed sheets are extremely dull, and black sheets are seldom an important factor in the local demand. The jobbing movement of galvanized sheets is quite lively, being almost if not quite up to normal, and stocks in some of the corrugating sizes are running short. The principal demand is for building in

the agricultural districts. Specifications are going in to the mills fairly well, though merchants show a cautious attitude and individual purchases are small. Sheet shipments so far received through the Panama Canal have arrived in good shape, but this route is still considered as experimental, and some buyers continue to receive by rail.

Standard Pipe.—The usual fall demand in the country has not developed to any great extent, and the local trade is quiet. Merchants are amply supplied for current needs, and are buying practically nothing. No encouraging feature has developed in the oil country, and supply houses there are curtailing their operations.

Cast-Iron Pipe.—The city of Los Angeles has taken bids on two lots, aggregating 750 tons, and the city of Pasadena is in the market for about 150 tons. No business of any consequence has been done in San Francisco or vicinity, and the northern trade is quiet. Considerable delay is encountered in carrying out municipal projects, owing to difficulty in financing. Prices are unchanged, at $32 per net ton for 6-in. and over; $34 for 4-in.; and $1 extra for gas pipe.

Pig Iron.—While there are some slightly favorable indications in the foundry trade, business on the whole is dull, and there is practically no demand for pig iron. Foundries, as a rule, have been amply supplied with foreign iron by arrivals on old contracts, and several rather large arrivals during the last fortnight have brought out a selling movement on the part of melters. Prices are accordingly rather demoralized, with offerings of Middlesbrough reported at about $19 per gross ton. Tata (Indian) iron has been moving at about $21 to $22. A local shipping firm has brought in a small stock of No. 1 and 2X Thomas iron, which finds no demand at present and is offered at about $22.

Coke.—Three vessels have arrived recently with good-sized shipments of German Syndicate coke, and there are a number of cargoes still afloat, assuring an ample supply for local needs for some time. No more is available from primary sources, however, and importers are taking a firm attitude. German Syndicate coke, delivered at the foundries from local yards, is now quoted at $15 per gross ton; and cargoes to arrive are quoted at $13 to $13.50 at ship's side.

Old Material.—The effort to raise the price of cast-iron scrap has met with little success, purchases having lately been made at $14.50 to $15 per net ton. The movement is fairly steady. There is only a limited movement of steel melting scrap, $8 per gross ton being about the average price. The principal requirements have been covered by contracts. About 1500 tons of miscellaneous scrap is on the way here from Honolulu.

New York

NEW YORK, September 30, 1914.

Pig Iron.—An inquiry for 500 tons is the largest before the local trade, so far as can be learned. Two gray iron foundries in New Jersey have bought 200 tons each in the past week for delivery this year and a 100-ton purchase was made by an up-State foundry. Foundry operations may be considered at low point or close to it, as no falling off has been reported in the past fortnight and there are indications that New England foundries which depend on the textile industry will be somewhat more active in the near future. Virginia irons have been very little in demand and stocks in that State have increased in the past month by several thousand tons, the total now being around 160,000 tons. Only three Virginia furnaces are in blast. In eastern Pennsylvania it is understood stocks are less than the total of a month ago. Prices while not stronger have not weakened further in the main, though one aggressive seller has made offers below the general market. We quote Northern iron for tidewater delivery as follows: No. 1 foundry, $14.75 to $15; No. 2 X, $14.25 to $14.50; No. 2 plain, $14 to $14.25. Southern iron is quoted at $14.75 to $15 for No. 1 and $14.25 to $14.50 for No. 2.

Ferroalloys.—Shipments of English ferromanganese are now being made nearly up to the contract rate. While $80 at Baltimore is named as the usual price on new business, it is quite evident that English makers will have no metal to dispose of for shipment in the next three months if they keep up with their contract requirements. While a gradual increase in the supply is looked for, since more foreign ore is expected to be available, the belief that the war will be prolonged is leading to a general conservation of manganese, and selling by the Steel Corporation is considered unlikely. On 50 per cent. ferrosilicon we continue the quotation of $71 to $73, Pittsburgh.

Finished Iron and Steel.—October, it is agreed, will be a decidedly lean month for steel mill operations. A few contracts with jobbers for the last quarter have been closed at prevailing quotations, and it appears that jobbers' stocks are fairly large and for this, as well as broad reasons, they are not desirous of seeing a downward change in price. It happens however that more is said of the possibility of lower prices than has recently been the rule. For example, no new business was heard of in plates at higher than 1.15c. Pittsburgh, and in fact less than carloads have been sold below 1.39c. New York, the mill giving the buyer a part of the so-called freight advantage of the eastern mill over Pittsburgh. One explanation is that the buyers of Pittsburgh plates are covered by contracts and the smaller buyers continually in the market have commonly patronized the eastern mills. Enough business in plates at the lower level is moving to justify a revision of New York prices. Keen competition is noted also for fabricated steel work with resultant shaving of prices for the plain material and it is admitted that in the really large projects at present under consideration, a mill price of 1.10c. Pittsburgh is expected. The point is made that some mills will be found sufficiently anxious for the orders to make the concession, particularly if the conditions are attractive from the rolling standpoint. Some new structural steel projects have appeared but awards are light. A little spurt in steel plate orders, all of small size, is noted. Bar iron demand has dropped off. Nothing is doing or expected in railroad rails or cars until it becomes apparent that railroads can secure the money to buy, and car shops are active only in the steel passenger car departments where operations will continue into the second quarter on orders now on the books. One export proposition which looks promising is for 12,000 to 15,000 tons of plates for Australia. In structural steel bids will be taken in October on about 2500 tons for movable dams and bridges for the Barge Canal; on 900 tons for the Orthopaedic hospital; on 900 tons for the Fullerton-Weaver apartment, 400 Park avenue; on 900 tons for a normal college at Canyon, Tex.; and on 400 tons for the New Haven. Plans are out for the loft building at Thirty-fifth street and Broadway, though it is not definite that construction will be attempted before next spring. Among recent awards may be mentioned 1500 tons for the Congress street bridge at Troy, N. Y., to the Fort Pitt Bridge Works; 700 tons for the Hanover bascule bridge, Baltimore, to the Strobel Steel Construction Company and 150 tons for the Baltimore & Ohio at Chester to the Pennsylvania Steel Company. The Bethlehem Steel Company is to fabricate 10 shields for East river subway tunnel construction, involving 850 tons, but it is understood that the plates had been purchased. We quote mill shipments of steel bars and shapes at 1.20c., Pittsburgh, or 1.36c., New York, steel plates at 1.31c. to 1.36c. New York, and iron bars at 1.25c. to 1.30c., New York. For lots from store we quote iron and steel bars at 1.80c. to 1.85c., New York, and plate and structural material at 1.85c. to 1.90c.

Cast-Iron Pipe.—Nothing of importance has occurred as to new municipal lettings. The city of Salem, Mass., has given no indication when bids may be asked on the large quantity of pipe required for next spring. Private buying is about normal for the season. Pipe founders express little complaint regarding the volume of business booked in the past two or three months, this having been probably better than in other branches of the iron trade, but the situation as to prices has been and still is exceedingly unsatisfactory. No evidence appears of the market stiffening. Carload

lots of 6-in. are to be had at $20 to $20.50, per net ton, tidewater.

Old Material.—The only business now being done is in cast scrap for foundry use, but even in that line sales have not been numerous and the quantities have not been large. Inquiries now coming out for cast scrap are, however, somewhat better. Steel scrap and rolling-mill stock are stagnant. Wrought scrap is exceedingly weak. Relaying rails have been in moderate request. Dealers' quotations are as follows, per gross ton, New York:

Old girder and T rails for melting	$7.75 to $8.25
Heavy melting steel scrap	7.75 to 8.25
Relaying rails	20.00 to 20.50
Rerolling rails	9.50 to 10.00
Iron car axles	15.00 to 15.50
Steel car axles	11.50 to 12.00
No. 1 railroad wrought	9.50 to 10.00
Wrought-iron track scrap	9.00 to 9.50
No. 1 yard wrought, long	8.25 to 8.75
No. 1 yard wrought, short	8.00 to 8.50
Light iron	3.25 to 3.50
Cast borings	6.25 to 6.50
Wrought turnings	6.00 to 6.25
Wrought pipe	8.00 to 8.50
Car wheels	9.50 to 10.00
No. 1 heavy cast, broken up	10.25 to 10.75
Stove plate	7.75 to 8.25
Locomotive grate bars	6.50 to 7.00
Malleable cast	7.50 to 8.00

British Sentiment Slightly Better

Trade Dislocation Less Than Feared—Pig-Iron Position Better—Steel Trade Quiet

(By Cable)

LONDON, ENGLAND, September 30, 1914.

The pig-iron shipping position seems a little better and the feeling has slightly improved, trade dislocation being less than feared. Large arrivals of ore are noted, being partly diverted cargoes. The Spanish output has been greatly reduced. Japan has bought a few lots of foundry iron. Stocks of pig iron in Connal's stores are 103,012 gross tons, against 99,930 tons last week. Active furnaces in the three districts are 158, against 193 a year ago. Ferromanganese is quoted at about £17 ($82.73) but is nominal in the absence of new demands for export. Steel is on the easy side, fresh buying being very subdued. America is more ready to sell semi-finished steel but the general demand for this material is indifferent, owing to the poor situation of the tin-plate and galvanized sheet trades. The United States Steel Corporation has reduced sheet bars to 100s. ($24.33), covering cost, freight and insurance. Such quotations as are available are as follows:

Tin plates, coke, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 12s. 9d. ($3.10), against 12s. 10½d. ($3.13) last week.

Cleveland pig iron warrants (Tuesday), 50s. 11d. ($12.39), against 51s. ($12.41) last week.

No. 3 Cleveland pig iron, makers' price, f.o.b. Middlesbrough, 51s. 3d. ($12.47), against 51s. 6d. ($12.53) last week.

Steel black sheets, No. 28, export, f.o.b. Liverpool, £9 5s. ($45.01), against £9 10s. ($46.22) last week.

Steel ship plates, Scotch, delivered local yards, £7 ($34.06).

Steel rails, export, f.o.b. works' port, £6 5s. ($30.41).

Hematite pig iron, f.o.b. Tees, 66s. 9d. ($16.24), against 67s. ($16.30) last week.

Sheet bars (Welsh), delivered at works in Swansea Valley, £5 2s. 6d. ($24.94).

Steel joists, 15 in., export, f.o.b. Hull or Grimsby, £6 12s. 6d. ($32.23), against £6 15s. ($32.84) last week.

Steel bars, export, f.o.b. Clyde, £7 2s. 6d. ($34.67).

British Insist American Prices on Billets and Sheet Bars Are Too High

(By Mail)

LONDON, September 16, 1914.

The British pig iron market is passing through very calm waters, and business is as restricted as was to be expected, from the entire cessation of foreign demand except small lots for Italy and Japan. Anything in the way of the usual class of buying for the Continent of Europe, has come to an end. The make of iron has been much cut down in the Cleveland district. Men are scarce, of course, owing to so many being called to the colors, but the lack of demand is a more important consideration. An additional depressing factor upon export trade has been the mine-strewn condition of the North Sea which has put the fear of loss before the eyes of shipowners.

The tone of pig iron has been pretty steady, with occasional losses of a few ha'pence in warrant prices, but fluctuations here are not of much account in considering the actual state of trade of the country. There is not much change in the position of stocks as represented by the warrant holdings, but the tendency is toward an expansion. Makers are believed to have a good deal more iron in their yards than for some time, and this might easily be the case without there being any great surplus. East Coast hematite has weakened considerably, and is today no better than about 67s. 6d. ($16.42) for mixed numbers f.o.b. Makers are not pressing sales, however, and the market is dull. Ore looks like falling. There is an ample supply available.

SOLD UP ON FERROMANGANESE FOR 1914

In ferromanganese there is no alteration of the position. The works as a rule are very fully booked and have been refusing further business for this year. It is considered doubtful if they will be in a position to deliver all they have sold for 1914 and the question of additional business is hardly within the region of the practical at the moment. Quotations vary, but up to £21 ($102.19) a ton is asked for export packed, and £20 ($97.32) for loose.

The finished iron trade is firm but without much new business being booked. Makers of best quality iron bars are well situated and the plants running on the commoner sorts are decidedly independent, the entire absence of foreign competition being a strong point for them. It is now being complained that the bar makers are growing too independent, and the appearance of a little foreign competition from quarters now silent would be welcomed by consumers. There is no chance of the Belgian works coming into the export market for months to come. Some of them seem to have escaped the attentions of the Germans and the Sambre et Moselle plant is reported to have passed unscathed through the cataclysm.

In semi-finished steel there is nothing doing. Inquiries sent to America are regarded as not having been treated seriously by the Steel Corporation and the independents, and consequently there is a lull. There is no use, buyers here say, in American producers thinking they are going to pay fancy prices for steel at this juncture. At reasonable prices they are buyers, but they do not consider £5 ($24.33) a ton f.o.b. New York is reasonable under current conditions, for billets, etc.

Finished steel is quiet and a rather easier tendency has developed. There is really no alteration fundamentally, but the tone has gone off the boil and prices have shed a few shillings.

Metal Market

NEW YORK, September 30, 1914.

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York			Lead		Spelter	
Sept.	Lake	Electrolytic	Tin, New York	New York	St. Louis	New York	St. Louis
23	12.50	11.87½	31.50	3.85	3.67½	5.25	5.10
24	12.50	11.87½	31.20	3.75	3.60	5.15	5.10
25	12.37½	11.87½	31.00	3.75	3.60	5.15	5.00
26	12.37½	11.87½	.....	3.75	3.60	5.15	5.00
28	12.37½	11.87½	30.75	3.75	3.57½	5.15	5.00
29	12.25	11.75	30.87½	3.75	3.57½	5.15	5.00

Copper continues dull and is lower. Tin has declined despite a flurry in buying. Lead has been reduced, but remains dull and weak. Lack of demand has caused spelter prices to drop. Antimony is without change.

New York

Copper.—Buying is so scarce that it is difficult to locate the actual level of prices. In the case of elec-

trolytic, an offering was made at 11.80c., cash, New York, with intimations that 11.75c., might be accepted. The latter price was not accepted, however, and the consumer for whom the inquiry was made asserts that he bought at 11.70c. Domestic consumption is light. Most of the recent exports have been of metal that was purchased some time ago. The placing of copper on the conditional contraband list by England promises to restrict shipments still more than they have been as she will not permit neutral countries to receive more copper than they require for their own needs, her object being to prevent reshipment to Germany. In Holland she has already taken action by practically confiscating the copper stored there and which happened to be owned by a large American selling company. She first took possession of the warrants which represented the copper and which were in the hands of a London house, then went to Rotterdam, obtained the copper and paid for it. It was then removed to London. From this time on, according to announcement, England will seize, en route, all of the copper, the ultimate destination of which is in doubt. Lake copper has been offered at 12.37½c. and has weakened under the lower quotation for electrolytic. Exports this month total 16,838 tons.

Tin.—The market was dull until September 29, when there was a flurry and probably 200 to 300 tons were bought at prices that ranged from 30.62½c. to 30.87½c. At the close of the market on that day several bids of 30.87½c. were pending, but 31c. was asked. The deliveries dealt in were all the way from spot to March. Most of the future sales are still without guarantee. The deliveries this month reached the excellent total of 3600 tons and there is now in stock and landing 1603 tons. Arrivals of the month total 3856 tons and there is afloat 1290 tons. Shipments from London which are in sight are lighter than those of recent date and most of the spot tin is in strong hands.

Lead.—This metal has been very dull which probably was the cause of the action of the largest producer in reducing prices on September 24 to 3.75c., New York, and 3.60c., St. Louis. Since then the Western price has weakened to 3.57½c.

Spelter.—Under the light demand from both domestic and foreign sources the market has dropped to 5.15c., New York, and 5c., St. Louis. Practically the only consumers of spelter who are busy are the manufacturers of sheet zinc.

Antimony.—The market is without interesting features with all quotations weak. Cookson's is about 11c., Hallett's 10c. and other grades 9c.

Old Metals.—The market is lifeless. Dealers' selling prices, which have been reduced, are nominally as follows:

	Cents per lb.
Copper, heavy and crucible	11.75 to 12.00
Copper, heavy and wire	11.25 to 11.50
Copper, light and bottoms	10.25 to 10.50
Brass, heavy	8.50 to 8.75
Brass, light	6.25 to 6.50
Heavy machine composition	11.00 to 11.25
Clean brass turnings	8.00 to 8.25
Composition turnings	9.00 to 9.50
Lead, heavy	3.50
Lead, tea	3.25
Zinc scrap	4.00

Chicago

September 28.—The general trend of the metal market has been downward without presenting any sharp fluctuations. We quote as follows: Casting copper, 12.25c.; Lake copper, 12.50c., for prompt shipment; small lots, ⅛c. to ¼c. higher; pig tin, carloads, 31.75c.; small lots, 33.75c.; lead, desilverized, 3.65c. to 3.72½c., and corroding, 4.10c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.05c. to 5.10c.; Cookson's antimony, 14c. for cask lots; other grades 10c. to 11c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 11c.; copper bottoms, 9.75c.; copper clips, 10.25c.; red brass, 10c.; yellow brass, 7.50c.; lead pipe, 3.30c.; zinc, 3.50c.; pewter, No. 1, 23c.; tinfoil, 27c.; block tin pipe, 29c.

St. Louis

SEPTEMBER 28.—The nonferrous metals, particularly the Missouri products, have shown a declining tendency and the quotations to-day are: Lead, 3.55c.; spelter, 5c.; tin, 33.50c.; Lake copper, 13c.; electrolytic copper, 12.90c.; Cookson's antimony, 12c. In the Joplin ore market there was a general decline of about $2 per ton, and zinc blende, 60 per cent. basis, sold from $40 to $42.50, with top settlement for the choicest ores $45.50. Calamine ranged from $21 to $23 for 40 per cent., with top settlement for the best grades $28. Lead ore was weak at $46 for 80 per cent. Miscellaneous scrap metals are quoted as follows: Light brass, 5.50c.; heavy yellow brass, 7c.; heavy red brass and light copper, 8.50c.; heavy copper and copper wire, 10c.; pewter, 20c.; tinfoil, 29c.; zinc, 3c.; tea lead, 3c.; lead, 3c.

Iron and Industrial Stocks

NEW YORK, September 30, 1914.

The New York Stock Exchange has now been closed exactly two months, which is considerably longer than had been expected. The consensus of opinion of stock brokers is that October 15 will see a resumption of business on at least part of the listed stocks. Among many members the selection of industrial stocks as a medium of trading, before active business is resumed in railroad stocks, finds much favor as foreign holdings of a considerable number of important industrial stocks are small. It is stated that if confidence should be established by business in industrial stocks it would facilitate a resumption of dealings in railroad stocks. A committee of five members of the Exchange, which was formed last week to oversee dealings in unlisted securities, ruled on Monday that it would act only to bring buyer and seller together, making public no transactions or quotations.

Dividends

Manning, Maxwell & Moore, regular quarterly, 1½ per cent., payable September 30.

The directors of the Dominion Steel Corporation have voted to defer action on the preferred dividend due October 1, owing to the disturbed business conditions all over the world. The dividend is cumulative, and will be paid as soon as business shows some indication of recovery.

The Westinghouse Electric & Mfg. Company, regular quarterly, 1¾ per cent. on the preferred stock, payable October 15, and 1 per cent. on the common, payable October 30.

The Otis Elevator Company, regular quarterly, 1½ per cent. on the preferred and 1 per cent. on the common stock, both payable October 15.

The directors of the American Shipbuilding Company have decided, in view of the falling off in earnings and because of conditions brought about by the war, to declare no dividend on the preferred stock at this time. The dividend would have been paid out of the earnings to June 30, 1914.

The National Enameling & Stamping Company, regular quarterly, 1¾ per cent. on the preferred stock, payable September 30.

The Westinghouse Air Brake Company, regular quarterly, $2 a share, payable October 15.

The American La France Fire Engine Company, regular quarterly, 1¾ per cent. on the preferred stock, payable October 1.

The American Screw Company, regular quarterly, 1½ per cent., payable September 30.

The E. W. Bliss Company, regular quarterly, 2 per cent. on the preferred stock, and 1¼ per cent. on the common stock, both payable October 1.

The Canadian Locomotive Company, regular quarterly, 1¾ per cent. on the preferred stock, payable October 1.

The Yale & Towne Mfg. Company, regular quarterly, 1¾ per cent., payable October 1.

The Chicago Pneumatic Tool Company, regular quarterly, 1 per cent., payable October 26.

CLAYTON ANTI-TRUST BILL

Provisions of the Bill as Agreed Upon by the Conferees

WASHINGTON, D. C., September 30, 1914.—The conference committee representing the Senate and House has agreed upon the provisions of the Clayton omnibus anti-trust bill. With the exception of the sections relating to organized labor, the modifications made have all been in the line of conservatism, President Wilson and the conferees alike taking the position that this is not an opportune time for the adoption of drastic measures against any form of business, whether big or little. It is also believed that certain of the changes said to have been made at the suggestion of the Attorney General are intended to obviate the danger that some of the radical provisions added to the bill by the Senate would have been held by the courts to be repugnant to the constitution.

THE LABOR PROVISIONS

The declaratory section of the bill exempting labor organizations, etc., from the operation of the anti-trust laws has been a bone of contention since its first draft by the House committee. In the Senate a preamble was adopted to the effect that labor should not be regarded as a commodity or article of commerce. The conferees, in approving this section substantially as passed by the Senate, call attention to the fact that while "labor" is not a "commodity or article of commerce," anything produced by labor, whether by a mechanic or a farmer, is necessarily a commodity, and, therefore, the exemption applies only to acts of associations with respect to their labor and not with respect to their products; in other words, the exemption would not extend to the products of co-operative labor or to the produce of farmers. The section as it will go on the statute books is as follows:

That the labor of a human being is not a commodity or article of commerce. Nothing contained in the anti-trust laws shall be construed to forbid the existence and operation of labor, agricultural, or horticultural organizations, instituted for the purposes of mutual help, and not having capital stock or conducted for profit, or to forbid or restrain individual members of such organizations from lawfully carrying out the legitimate objects thereof; nor shall such organizations, or the members thereof, be held or construed to be illegal combinations or conspiracies in restraint of trade, under the anti-trust laws.

The provisions of section 18 of the original bill legalizing boycotting, picketing and other practices frequently resorted to by labor organizations in pursuance of strikes have been subjected to many changes. The conference committee, as a part of new section 20, has finally agreed to the following text:

And no such restraining order or injunction shall prohibit any person or persons, whether singly or in concert, from terminating any relation of employment, or from ceasing to perform any work or labor, or from recommending, advising, or persuading others by peaceful means so to do; or from attending at any place where any such person or persons may lawfully be, for the purpose of peacefully obtaining or communicating information, or from peacefully persuading any person to work or to abstain from working; or from ceasing to patronize or to employ any party to such dispute, or from recommending, advising or persuading others by peaceful and lawful means so to do; or from paying or giving to, or withholding from, any person engaged in such dispute, any strike benefits or other moneys or things of value; or from peaceably assembling in a lawful manner, and for lawful purposes; or from doing any act or thing which might lawfully be done in the absence of such dispute by any party thereto; nor shall any of the acts specified in this paragraph be considered or held to be violations of any law of the United States.

The conferees make the point that no privilege is here given to organized workingmen which they do not enjoy under existing laws. The declaration of the House bill giving the right to picket "at or near a house or place where any person resides or works or carries on business or happens to be" is denied by the conferees, and gatherings are permitted only "at any place where any such person or persons may lawfully be." Taken as a whole, the labor sections as they go on the statute books are far less objectionable than the corresponding provisions of the original bill.

PROVISIONS IMPORTANT TO MANUFACTURING CORPORATIONS

The Senate entirely struck out the House provision relating to price discrimination, but the conferees have rewritten the section, which is one of the most important features of the new law, and which as it becomes a statute reads as follows:

That it shall be unlawful for any person engaged in commerce, in the course of such commerce, either directly or indirectly, to discriminate in price between different purchasers of commodities, which commodities are sold for use, consumption, or resale, . . . where the effect of such discrimination may be to substantially lessen competition or tend to create a monopoly in any line of commerce; Provided, That nothing herein contained shall prevent discrimination in price between purchasers of commodities on account of differences in the grade, quality, or quantity of the commodity sold, or that makes only due allowance for difference in the cost of selling or transportation, or discrimination in price in the same or different communities made in good faith to meet competition; And provided further, That nothing herein contained shall prevent persons engaged in selling goods, wares, or merchandise in commerce from selecting their own customers in bona fide transactions and not in restraint of trade.

The House provision forbidding arbitrary refusal to sell the products of "any mine, oil or gas well, reduction works, refinery, etc.," to a responsible purchaser aroused great opposition in the Senate where it was finally stricken out. The friends of the provision fought hard for its retention by the conferees, but they finally decided to abandon it.

In section 4 of the original draft it was intended to make unlawful contracts by manufacturers or dealers for the sale of machinery or other devices on the condition that the purchaser shall not use the machines or supplies of a competing manufacturer or dealer. It was originally provided that any violation of the law should be treated as a misdemeanor and the guilty person punished by a fine not exceeding $5000 or by imprisonment not exceeding one year or by both, in the discretion of the court. The conferees made radical changes in this section, rewriting the entire text and eliminating the penalties for violations. The provision as thus changed is as follows:

That it shall be unlawful for any person engaged in commerce, in the course of such commerce, to lease or make a sale or contract for sale of goods, wares, merchandise, machinery, supplies or other commodities, whether patented or unpatented, for use, consumption or resale, ... or fix a price charged therefor, or discount from, or rebate upon, such price, on the condition, agreement or understanding that the lessee or purchaser thereof shall not use or deal in the goods, wares, merchandise, machinery, supplies or other commodities of a competitor or competitors of the lessor or seller, where the effect of such lease, sale, or contract for sale or such condition, agreement or understanding may be to substantially lessen competition or tend to create a monopoly in any line of commerce.

The chief provisions of the bill relating to interlocking directorates apply to banking concerns and common carriers only, but section 8 of the measure as finally agreed to provides that, from and after two years from the passage of the act, no person shall at the same time be a director in any two or more corporations any one of which has capital, surplus and undivided profits aggregating more than $1,000,000, "if such corporations are, or shall have been theretofore, by virtue of their business and location of operation, competitors, so that the elimination of competition by an agreement between them would constitute a violation of any of the anti-trust laws."

Perhaps the most strenuous contest in the conference committee related to section 25, inserted in the bill by the Senate, providing that in the case of a corporation adjudged to be a monopoly or combination in restraint of trade "the court rendering such judgment shall decree its dissolution and shall to that end appoint receivers to wind up its affairs and shall cause all of its assets to be sold in such manner and to such persons as will, in the opinion of the court, restore competition as fully and completely as it was before said corporation or combination began to be formed." This drastic provision was strongly insisted upon by the Senate conferees but in deference to the President's views it was finally stricken out. W. L. C.

Developments in the Foreign Trade Situation

A Warning from the Pan-American Union—Increase in Orders, Many Being for the Account of European Governments

In line with the editorial on "Sanity on South American Trade" in *The Iron Age* of September 24, late official utterances at Washington are urging caution in view of the serious financial situation in a number of Latin-American countries. In a special bulletin issued this week, based on cable advices from thirty-four cities in Latin-America, Director General John Barrett of the Pan American Union says that the Latin-American market "while vastly potential is at this moment embarrassed by a serious financial stringency and dislocation of commercial conditions for which it is not in itself to blame."

The developments of the past week concerning export trade in iron and steel and machinery lines indicate that more machine tools are being bought for Europe and that the demand for iron and steel from that source is increasing. A good many contracts have been put through to which no publicity can be given. But it may be said that the purchases in this country for foreign governments in a great variety of lines are large.

Various Lines in Which Orders Are Due to the War

Early in the past summer the Pratt & Whitney Company, Hartford, Conn., was so dull that in one period of ten days not an order of any description was received. To-day these great works have upon their books orders of so great a total that if no other business was received for a year the plant would be working full time. This new condition may be attributed directly to the war.

The Bethlehem Steel Company is in the market for 40 20-in. engine lathes, inquiries for which have been sent to all the manufacturers of this class of machinery in the country. These lathes cannot be furnished from stock because of the special nature of the product which they are designed to manufacture. The machines will be of the heaviest construction and will handle the toughest quality of steel.

Manufacturers of paper-making machinery are exceedingly busy operating at full capacity. This also is a direct result of the war. The demand for paper resulting from the enormously increased circulation of the daily papers is very great, and the condition of the pulp market is another very important factor. To illustrate the case, the Rice, Barton & Fales Machine & Iron Company, Worcester, Mass., is running full time with a full force of men. Two months ago the company found business very dull.

Makers of brushes used in manufacturing are prospering because of the cutting off of imports from Europe. Hitherto the Germans have been able to undersell the United States in many lines of this product, and in some cases the margin of difference in prices was large. A typical example was the type of brush used in cleaning miners' lamps. The German prices were so low that American competition was absolutely eliminated. Now these brushes are being furnished by American makers.

Instances are multiplying where the withdrawal of European competition has brought beneficial results to American manufacturers. The effect upon the cutlery industry has already been noted. In New Britain, Conn., some lines of hardware are prospering because competing lines from abroad are out of the market. The effect upon many varieties of small tools is apparent. From Danbury, Conn., comes the information that the manufacturers of hats are rushed with new business. Some chemical works have increased their operations.

German Machine Tool Export Firms Not Inactive

Notwithstanding the difficulties in transmitting information between this country and Europe, both cables and letters have been received by the New York branches of German machine tool export houses from their home offices in Germany and from other countries. The communications, it is pointed out by one manager located in New York, indicate that his firm is far from being inactive, despite the war and that the chief difficulty which his house is encountering is in making shipments. His company has offices in most of the countries of continental Europe and referring to the business in some of them he made the following observations, based on recent letters and reports received:

"The sales of machine tools in Germany in August and September have been good, in fact not much lower than before the war. Most of the machines sold have been automatics and turret lathes for use in shops which are engaged in the manufacture of war material, although there also is a good market for ordinary lathes and other standard machines. The latter have been taken by the regular customers of the German machine tool houses.

"The stock of American tools is practically disposed of and it seems that there would be place for more of them if there were any way of getting them into Germany. German-made machines out of stock are nearly all exhausted, also, and therefore I assume that some of these factories are busy again on their own line.

"From our branches in belligerent countries other than Germany, we have not received much information, but it appears that all of them are doing business, although we do not know to what extent.

"In Italy and Spain business is dull, but appears to be picking up, part of which is due to the sale of several American machines. In some cases, where orders had been booked in Spain and tools could not be obtained in Germany, inquiries were forwarded to this country and quotations have already been sent. Should they prove satisfactory the machines will be shipped to Spain at the earliest opportunity. The inquiries are for equipment required by a foundry and machine shop. Included in the list on which quotations have been sent are converters, furnaces, molding machines, sandblast equipment, etc., as well as lathes, planers, slotting machines, and cranes.

"From Austria, where business has been poor for the last year, some good sales were made in August and some American tools which were not in stock in Vienna have been ordered here. The problem is how these machines are to be placed in Austria."

Export Trade Notes

Reports have been widely circulated in the past week that the Russian Government had ordered 50,000 steel barrels from the United States. One report definitely located the order, but the firm named, whose plant is in western Pennsylvania, says that the story connecting it with such an order is without foundation. It has been stated that heretofore Russia has bought these barrels from Germany.

The National Association of Manufacturers has received at its New York office a letter from Yuan Shih-kai, president of the Chinese Republic, saying that the visit of representatives of the association to China in the past summer gave an opportunity for cementing friendship and forwarding cooperation between China and the United States in trade and the advancement of peace.

Norway, Holland and Turkey have considerable inquiries before American manufacturers for electrical machinery and supplies. Norway is preparing to install powerful searchlights on her coast. Holland will buy equipment for lighting up her frontier and sea entrances. Turkey is inquiring for equipment for electric lighting.

At Philadelphia an order has been placed for several thousand "gun shovels" for the British Government.

Alba B. Johnson, president of the Baldwin Locomotive Works, at a meeting of the South American Trade Committee at Philadelphia, September 29, emphasized the danger of any proceeding in Latin-American trade not characterized by business-like caution. He told of an interview with the diplomatic representative of the Argentine Republic, in which the latter said that South American countries would not turn naturally to the United States, but would have to build up trade with this country by slow degrees. Mr. Johnson pointed out that the financial situation in leading South American countries is serious.

A Cleveland, Ohio, automobile builder has shipped about 50 motor trucks to the Russian Government for use in military operations. A rush order was received for these and shipments were made about a week later. It is understood that various other inquiries from the belligerent nations are pending for motor trucks and other war equipment and material, but orders and inquiries for anything needed by the countries at war are being guarded with the utmost secrecy.

J. Rogers Flannery, president Flannery Nut & Bolt Company, and J. J. Nordman, who are president and secretary respectively of the foreign trade commission of Pittsburgh, recently visited Washington to confer with representatives of the Department of Commerce and with South American diplomats relative to increasing the exports of Pittsburgh. Mr. Flannery is the Pittsburgh commission's representative in the National Foreign Trade Council. The Pittsburgh commission is already receiving letters from European companies desiring to establish connections in the United States with manufacturers of electrical and other machinery and various engineering specialties. One of these is from Gillespie & Beales, a London firm, who desire literature in electrical and machinery lines.

Wisconsin Manufacturers and Latin-American Business

To promote the sale of Wisconsin-made products in foreign markets, particularly of South America, a joint committee in foreign trade has been appointed by President F. W. Rogers, of the Merchants and Manufacturers' Association of Milwaukee, and President Harry W. Bolens, Port Washington, of the Wisconsin Manufacturers' Association. All the members of the committee are familiar either with European or South American and oriental fields. The committee includes several experts who thoroughly understand the peculiarities of the various countries and who have an understanding also of their trade possibilities. The first meeting was held September 22, when steps were taken to list all Wisconsin-made products, together with information as to their adaptability for the various foreign countries. The next step will be a grouping of articles into allied trade lines for the purpose of securing effective salesmanship. In this connection arises the question of operating through selling agencies or directly through personal representatives. The committee also will gather information as to banking methods, selling campaigns, etc.

Express Company Investigation in South America

The American Express Company has plans in motion for an investigation of the opportunities for the extension of American trade in South America and has arranged for the departure on October 7 of two representatives, one of whom also will represent the New York Central Lines. They will sail on the Cedric and re-embark at Liverpool for South America, sailing October 17, on the steamer Vasari. James Thane will go as special representative of the American Express Company and New York Central Lines and A. B. Howard as special representative of the financial department of the express company. They will visit in the order named, the chief ports or commercial centers of Brazil, Argentina, Uruguay, Chile and Peru, stopping on the return journey at Panama and Colon. If the investigation proves that the move is wise, the company will extend to South America both its forwarding and banking facilities.

The company has been receiving a great deal of information from manufacturers as to what they have to offer in South America and invites inquiries, provided they are made specific, regarding the exports and imports of the countries mentioned. Letters should be addressed to the Foreign Department, South American Division, American Express Company, 65 Broadway, and those which are received after the departure of Messrs. Thane and Howard, will be forwarded to them. Manufacturers who wish to send catalogues are requested to send a simple illustrated sheet, or at most but a few sheets. These should be printed not only in English, but in Spanish and Portuguese.

A Note of Caution and Warning

John Barrett, director general of the Pan-American Union, the international organization maintained in Washington by all the American republics for the development of their commerce, has made inquiry by cable to ascertain the exact business situation in Latin-America. From information cabled him from 34 different cities in the 20 Latin-American countries, he has issued a memorandum to commercial and financial interests of this country, urging caution in view of the serious financial condition in a number of the countries on the south. In part it is as follows:

> These advices emphasize that what is needed at this hour in Latin-America is not so much a supply of the manufactured products of the United States, although required in considerable quantities, but money, loans and advances, credits on purchases, and markets at reasonable rates for raw products which usually go to Europe. If Latin-America can sell at a fair figure her accumulating raw products and buy, in turn, through receiving financial help and co-operation in the form of advances and credits from United States exporters, importers and bankers, the situation will be speedily remedied and the commercial interests of the United States and Latin-America will truly enter upon a new era of Pan-American commerce and comity.
>
> Despite the efforts not only of the Latin-American embassies, legations and consulates, but of the Pan-American Union, and the United States Departments of State and Commerce to state the situation exactly as it exists, countless articles have been appearing in various newspapers and magazines emphasizing an alleged "golden opportunity" without pointing out its actual and present environments of money tightness and dislocation of international commercial methods. Numerous business men and commercial agents, in consequence, are crowding the steamers bound for Latin-America with the expectation that they will find the Latin-Americans awaiting them with outstretched hands filled with gold and ready to buy everything and anything they have to sell. These men will presently return to the United States and unfairly condemn and criticise the markets and peoples of the countries visited.

A great stream of letters and telegrams from both North and South America are daily pouring into the office of the Pan-American Union, as the international American bureau of information, and they prove the widespread interest in the field and opportunity, but they are invariably answered not only with the statement of the actual opportunity but with an admonition that the Latin-American market, while vastly potential, is at this moment embarrassed by a serious financial stringency and dislocation of commercial conditions for which it is not in itself to blame.

The opportunity of the hour, therefore, in a word, is not so much one for immediate large sales of United States manufactured products as one for co-operation and mutual help, together with careful investigation of commercial conditions and preparation to meet future competition successfully.

Opportunity for Greater Trade With Russia

Between Russia and the United States there are already trade connections, but on a scale far short of what they should be. This condition, in the opinion of a student of Russian trade, is due to the fact that these two countries are very far apart, and as a consequence many American business men have either hazy or distorted ideas with respect to Russia. Other countries, such as England and Germany in particular, take advantage of this fact, supplying Russia not only with their own manufactures, but also (notably in the case of Germany) with American manufactures.

All Russia consists of six parts: European Russia proper; Asiatic Russia; Finland; Poland; Caucasia; Siberia. Russia is divided into 52 provinces comprising an area of 1,883,870 square miles. The Arctic Ocean on the north and the Black Sea on the south are regarded as her water boundaries, while the Caucasus and the Ural mountains are the land boundaries. Poland is the most densely settled part of the country, Finland coming next, Russia proper being more sparsely populated. The south is more densely settled than the north.

The physical geography of Russia suggests that of the United States; her natural resources, at any rate, are not inferior to those of the United States. The only difference is that, owing to the fact that industry is very little developed in Russia, her rich mineral deposits and other natural resources have not as yet been investigated. Russia is primarily a farming country, and notwithstanding the fact that the acreage to be tilled is enormous, farming in many places not reached as yet by modern improved machinery is carried on by primitive methods. The Zemstvo (provincial assembly) facilitates the spread of agricultural machinery, and next to the Zemstvo in this respect come the co-operative societies that for the past few years have attracted the attention of the peasant farmers.

To get an idea of the imports into Russia from abroad, and particularly from the United States, some statistics collected by John H. Snodgrass, United States consul at Moscow, in 1911-1912, may be quoted. Imports in 1911 amounted to $526,672,000; in 1912, $532,768,500. Comparing these figures with those for imports during the preceding years, we find the amount of imports growing each year. The amount imported direct from the United States in 1911 was $51,918,700 and in 1912, $44,134,000. America's share in supplying the Russian market is barely one-fifth as much as Germany's, as Germany exported to Russia in 1911 products having a total value of $245,572,100, and in 1912 a total of $267,343,700. Evidently Germany's imports increase at the expense of other countries, including the United States. Moreover, according to the American consul's report, Germany as an intermediary agency is responsible for the importation into Russia of American merchandise to the value of $50,000,000.

An idea of the imports into Russia may be gained from the accompanying table:

Imports in Russia

	1911	1912
Arms and ammunition	$1,110,855	$1,137,120
Automobiles, bicycles, etc	6,098,115	6,855,680
Copper, bars, sheets, etc	2,425,650	2,887,605
Machinery, metal working	3,786,280	4,131,545
Machinery agricultural	23,266,670	25,901,440
Machinery, steam, electric and gas	13,852,985	13,318,085
Machinery, general	32,758,635	31,712,460
Lead	3,108,025	4,248,750

After the war Russia will have to cast about for new industrial countries capable of catering to her requirements. Fresh demands and new necessities are constantly arising in Russia as a consequence of her internal development. These needs have to do with improvements in agriculture, railway construction, sewer systems, timber felling, etc. The opportunity for business will bring to the front the problem of establishing direct steamship connection between Russia and the United States. This will also facilitate the flow of raw material from Russia into this country. The Russian export trade is a very extensive one, amounting in 1911 to $779,717,200 and in 1912 to $734,922,000. Here again it is impossible to compute the amount of goods imported into America from Russia, as Germany has been the intermediary in this respect, as well. A case in point is that of Russian hops imported into the United States from Germany.

Supply of American Tuning Pins Increased

To the Editor:—In a recent issue of *The Iron Age* manufacturers of steel in this country are advised to turn their attention to making tuning pins for pianos and other musical instruments, as since the beginning of the European war the German tuning pins had become unavailable for the market and only one factory in the United States was manufacturing tuning pins, with a capacity inadequate to meet the demands of the American piano makers. In reply permit us to state that the American Musical Supply Company has been manufacturing tuning pins in Jersey City since 1897 and that its new factory at Communipaw avenue is the largest tuning pin factory in the world.

The complicated and delicate machines necessary for the making of the pins are in many respects superior to the machines used in Germany, the home of the tuning pin. The men in charge of the manufacture of the tuning pins mastered the art of making them in the best known factories in Westphalia, Germany. Since the beginning of the war new machines have been put to work and the capacity of the plant increased to such an extent that every demand made by American piano makers can be met with reasonable promptness.

AMERICAN MUSICAL SUPPLY COMPANY.

Jersey City, N. J., September 26, 1914.

Directions for South American Trade That Still Need Emphasis

WASHINGTON, D. C., September 29, 1914.—Some interesting observations with regard to South America as an export field are contained in a report on the subject, prepared by Commercial Agent Otto Wilson, of the Department of Commerce, embracing results of a painstaking investigation undertaken for the purpose of supplying American exporters with reliable information as to the character of the field, the peculiar conditions to be encountered therein, especially in the competition to be met, and the most promising methods of building up trade. As this bulletin was prepared before the outbreak of the European war it is of special value as a sane and dispassionate review of conditions, free from the somewhat imaginative coloring that has of late characterized the suggestions of certain Government officials and others, whose intentions have been excellent but whose zeal has outrun their judgment. Mr. Wilson gives succinctly the reasons which have enabled England and Germany to build up so large a trade in South America and in this connection he says:

ENGLAND AND GERMANY LEAD

"The two great competitors of the United States in supplying South America are the United Kingdom and Germany, whose goods are to be found in every market. According to the statistics of South American countries, the total imports in 1912 from the United Kingdom amounted to $275,400,000, from Germany $177,100,000, and from the United States $152,000,000. Germany and the United Kingdom each take large amounts of South American exports annually; each

has very adequate steamship service, with plently of cargo in both directions; each has extensive banking representatives in the principal trade centers, and each has been actively at work in the field longer than the United States. The principal factor in furthering British trade, however, has been the enormous investments of capital in all parts of the continent, especially in railroads and mines, causing, in the first place, a considerable influx of English people, and in the second place a heavy importation of machinery, supplies, etc. The prominence of a few large English banks like the London and River Plate, London and Brazilian, and Anglo-South American, which have branches throughout South America, has been a very important factor in promoting British trade.

BANKS TAKE PART IN PROMOTIONS

"The Germans also owe a great deal to their banks, which lend active assistance to schemes of trade promotion; and the facility with which shipments are financed and credits handled through them has been noted as one of the greatest German assets in building up their South American trade. The most important influence for effecting this result, however, has been the thorough manner in which the Germans have investigated the special features of each particular market and the pains they have taken to see that their goods fitted in with what the people desired.

It is the established custom for young men from Germany who intend to engage in the export trade to spend some years in South America as a part of their commercial education, learning the language and studying the habits of the people. Through them a first-hand and detailed knowledge of the trade is acquired, and the information gained is closely followed. There are also in Germany many private and semiofficial associations devoted especially to the furtherance of the German export trade, and these not only disseminate information as to the kind of particular articles required by the trade but often subsidize agents to South American and other foreign fields who make a study of market conditions. The cooperation of all German influences in South America toward the one object of furthering trade has often been remarked, and it has resulted in the present high commercial position of the country in all parts of the continent. The promotion of United States trade in South America does not necessarily depend on following either English or German methods, but, as in the case of these countries, both the investment of American capital and the closer attention to details on the part of American exporters have been important factors in the trade increase of the last few years."

TRADING THROUGH EXPORTING HOUSES

The report deals in considerable detail with the methods most advisable for entering the South American field. A great part of the exporting business of the United States has been and is being done through the export commission houses located in New York, which are primarily the agents of foreign buyers, but in practice the business they do ranges from that of the simple buying agent to that of a mercantile house with branches in various countries of the world. The big advantage in dealing with them is that the American manufacturer avoids all trouble in regard to credits, shipping details, claims, etc., and receives his money promptly. For the manufacturer who regards his export trade as merely incidental, the report suggests that this is probably the best method to follow in selling goods in South America, but firms that wish to build up foreign business of their own will find it desirable to establish direct connections with the market.

DIRECT REPRESENTATION

"For accomplishing this object," says the report, "the whole testimony of investigators is to the effect that it is almost imperative for the firm to come into as close personal relations with the market as its means will allow. Most of the attempts to secure South American business made heretofore have consisted simply in sending a lot of catalogues in English to a list of names obtained from consuls or directories, and this is still being done to a considerable extent. In a few lines this may result in small orders, but nearly always it is a mere waste of postage, unless the catalogues have been specifically asked for.

"The most desirable of all methods, of course, is that of establishing a branch house in each important center, with a manager and a staff of employees, a warehouse for storing a stock of goods, and in the case of machinery a complete stock of spare parts. The firm's representative could thus watch the demands of the market closely, observe foreign competition, and most important of all form close associations with the buyers of their particular wares. This is the method adopted by many large concerns which have been responsible for much of the importations of American products in South America. But the plan involves a heavy expense and is out of the question for the average export firm. Alternative plans are the working of the market through traveling salesmen, as at home; the securing of resident agencies, houses already established in the trade and willing to take on a foreign line; and the working of the market through salesmen, agency, or branch houses in combination with other exporters in related but noncompeting lines.

"The first of these plans," the report continues, "has been and is being tried by a considerable number of firms with varying degrees of success, and the traveling salesman from the United States is becoming a more and more familiar figure in the trade centers. But successful trading by this means involves many more considerations in Latin America than at home. In the first place the traveling men must be of somewhat broader accomplishments than is necessary in the United States. The difference has been expressed in the exhortation to 'Send salesmen, not peddlers'—in other words, to send men who are capable of appreciating other elements in a situation than those relating merely to the profit a dealer may derive from handling an article. In this connection it seems well to emphasize again the point that has been so often made in regard to Latin-American trade, as it is reiterated by every observer of commercial conditions and is of vital importance, no matter what selling method may be adopted. This is that business is so largely a matter of friendship between buyer and seller instead of merely a question of mutual profit between individuals or firms that have no other interest in each other. A salesman should approach his prospective customer in the spirit of one gentleman dealing with another and should, if possible, bear letters of introduction from some firm, bank, or commercial organization of standing. There should be no attempt to hurry a transaction. The first visit may be only a brief call for the purpose of getting acquainted and paying his respects, with only an incidental mention of business, the consummation of which can be left to succeeding visits. After an order is secured and friendly relations once established repeat orders will be given partly as a matter of friendship, and attention to little details of courtesy, not only on the part of the salesman but in the correspondence of the firm as well, will go as far toward retaining the trade as favorable terms or lower prices.

"This makes it difficult for a new salesman unacquainted with dealers to make any showing on his first trip, and when in addition to this he is handicapped by a lack of knowledge of the language sales are practically out of the question. It also shows the great desirability of having a representative, either a branch house or a native firm, established in the city, so that personal relations can be cultivated with the dealers in the particular line handled. American salesmen have too often failed to take this vital trade feature into account, and United States firms have in cases employed French and German representatives who were able to obtain better results by understanding it. But this is hardly necessary any longer, as both the traveling men themselves and their employers are coming to understand what the trade demands and are adapting their methods to it."

TRAVELING EXPENSES HIGHER

Attention is drawn to the matter of traveling expenses, which in South America is a serious one and

one not clearly appreciated by American exporters. There are said to be constant complaints by American travelers that their houses raise objections to the size of their expense accounts and the necessary items entering into it seem to be much better understood by the principals of German, French and other European salesmen. Transportation difficulties, customs charges of all kinds, taxes on commercial travelers, and different usages in the business world pile up expenses which are quite unknown in the United States. Especially is this true of a salesman traveling with samples. The details of looking after the shipping of trunks, getting them through the customs, etc., often take so much attention and time that in cases where a number of trunks are carried German firms sometimes employ an extra man to accompany the salesman and look after the samples. Charges are also much higher for an inexperienced man, as prices asked for portage, unloading, lighterage, etc., are often regulated only by what the employee thinks he can obtain.

Traveling men carrying a number of related lines and representing several different firms often go abroad either singly or in parties, each house guaranteeing part of their expenses and paying a commission on sales. This practice, it is said, is sometimes successful, but frauds are often attempted and manufacturers should become acquainted with the men themselves before spending much money in this way. In any case, however, an export business of any magnitude could hardly be established and maintained on this basis.

AGAINST SOLE AGENCIES

The practice of giving sole agencies is advised against, especially in countries like Colombia and Venezuela, where communications are difficult and where a buyer in one part of the country may find it very inconvenient to have his goods sent through a distant firm in another part. It is better in such cases to grant a general agency to one firm covering the country and to induce it to send men and advertising matter to all districts, giving it a commission on all business obtained from the country but shipping direct to buyers in outlying sections. The whole question of agencies is of such importance, and the success or failure of an export venture depends so much on getting the right kind of representatives, that it is highly advisable for the export manager of the head of the American firm to make a trip through South America, observing conditions for himsef and personally selecting houses to push his goods.

A COMBINATION AMERICAN AGENCY

For smaller firms which cannot afford to enter the field through their own personal representatives, Mr. Wilson suggests that the best of all courses is to unite with other American firms handling related lines in the establishment in one or more trade centers of branch houses for selling all their lines. This plan provides what is constantly insisted on as most essential to advancing an export business—personal contact with buyers. It enables manufacturers to acquire an intimate knowledge as to the market's requirements and to keep in close touch with the work of competitors. Credit requests can be investigated and the very important matter of determining the justice of the claims for damaged shipments, etc., which are constantly arising, can be handled so that a good customer need not be lost. Such a house can, in short, do all that is necessary to advance the interests of its principals, and the expense may be reduced to very reasonable figures for each participant. This plan has not been extensively tried out as yet, mainly because the houses that cannot afford salesmen or branches of their own have been satisfied to work through export commission houses or simply through catalogues. But larger associations, such as the Chicago Association of Commerce, have been successfully maintaining such representatives for advisory rather than strictly commercial purposes, and it is probable that some such plan will be ultimately developed by smaller groups of exporters.

DO NOT OVERLOAD BUYERS

A point often overlooked in South American trade, which is strongly emphasized in the report, is that willing customers should not be overloaded with goods. If a single order is all that is desired this would not be so objectionable from the standpoint of the particular exporter, but in most cases a house wishes not so much to make a sale as to lay the foundation for a good export business. If this is desired, sales must be made judiciously. The turnover of stocks of goods in Latin America is comparatively slow and money is high, and it is easily possible to choke up a trade channel that should be kept running freely. If the exporter wishes not only to make sales but to prepare the ground for future sales, he must take into account the condition of his customer as well as his own. A few extra thousands of dollars on a single order may deprive the exporter of many times that much in future business.

Under the head of "Points for American Exporters" the report reiterates and emphasizes the familiar suggestions that poor packing, poor marking, failure to send goods as ordered, and insistence on cash with order or at least cash with documents, and the sending of catalogues and correspondence in English instead of Spanish or Portuguese will effectually prevent the establishment of trade in any part of South America. Considerable improvement in these particulars has been noted in the last few years, which indicates that Americans are paying closer attention to the necessity of meeting South American requirements. The packing is now probably no worse than that of the average nation exporting to South America, and a better acquaintance with the trade has led to credit extension, although for shorter periods than are allowed by English or German firms.

CONCERNING CREDIT

In discussing the matter of credit, the report makes this pertinent suggestion: "It seems best for American firms to continue to withhold credit until the standing of the proposed customer can be investigated, but this is becoming an easier matter than heretofore. In Uruguay and Argentina the facilities for obtaining reports of this nature are said to be as good as those in the United States, while the increasing number of American firms with personal representation in South America is making easier investigation by that means. The value of having a branch house, or a resident agent, is particularly emphasized in matters of this kind. It is more important to remember that the ordinary credit terms of 90 days are usually insisted on, even by many houses that do not need the credit, as they regard it as a point of honor and a refusal of the usual terms as a reflection on their integrity."

The futility of trying to initiate or materially increase business by letters or printed matter in English ought to be well understood by American exporters, but large quantities of literature are still sent to all parts of South America printed in the English language. In this particular, however, Americans are said to be no greater offenders than many large English houses. The Germans are said to be most careful in this matter and this item has been one of the most important factors in the steady increase of their trade. It is also emphasized that the use of metric weights and measures, instead of English and American standards, is a matter of almost as much importance as the use of the Spanish and Portuguese languages. W. L. C.

Effect of War on Our Commerce

WASHINGTON, D. C., September 29, 1914.—The effect of the European war on the commerce of the United States is shown in considerable detail by an elaborate statistical statement compiled by the Bureau of Foreign and Domestic Commerce, of the Department of Commerce, based on the imports and exports in the month of August by countries of origin and destination. The imports from all Europe show a decline from $67,884,432 for August, 1913, to $50,620,867 in 1914; from all North American countries they rose from $33,002,249 to $39,217,253; from South American countries they increased from $11,698,345 to $15,095,782; from Asia they declined from $22,511,441

to $20,629,273; from Oceania they rose from $1,536,741 to $3,514,573; while from Africa they declined from $1,018,342 to $690,142. The imports by countries of origin in detail are of special interest and are given as follows:

Countries	August, 1913	August, 1914
Argentina	$1,270,624	$4,173,415
Australia	564,609	751,888
Belgium	3,450,950	2,329,145
Brazil	4,746,956	5,094,398
Canada	11,157,845	15,550,650
China	2,694,377	2,482,149
Cuba	12,469,377	14,524,219
France	13,091,521	6,902,603
Germany	15,626,176	9,400,043
India, British	5,411,225	4,403,791
Italy	3,862,591	3,445,825
Japan	8,845,496	10,068,124
Mexico	6,028,426	6,154,189
Netherlands	2,605,396	3,446,042
Russia	1,725,123	760,231
United Kingdom	20,718,297	17,872,270

Our exports having been much more seriously affected by the war than our imports, the statistical showing is correspondingly more important. Our exports to all Europe declined from $107,195,851 in August, 1913, to $48,875,232 for the same month of 1914; to all North American countries there was a decrease from $52,184,235 to $47,671,961; to South American countries the decrease was from $12,280,952 to $5,312,457; to Asia there was a drop from $6,308,082 to $3,789,548; to Oceania the decline was from $6,943,612 to $3,306,885, while to Africa there was a decrease from $2,996,288 to $1,413,157.

The most extraordinary item in the exports by countries of destination is that showing an almost complete cessation of shipments to Germany. These declined from $21,301,274 in August, 1913, to $68,737 in the same month of 1914. The exports by countries of destination in detail are as follows:

Countries	August, 1913	August, 1914
Argentina	$5,139,818	$971,129
Australia	3,875,282	1,825,453
Belgium	9,322,252	432,527
Brazil	2,874,124	1,604,207
Canada	35,442,709	33,495,829
China	1,545,821	603,967
Cuba	6,523,519	6,160,892
France	10,750,624	7,420,800
Germany	21,301,274	68,737
India, British	543,649	450,353
Italy	5,274,678	1,169,326
Japan	2,272,025	1,739,815
Mexico	3,679,870	2,520,256
Netherlands	13,714,345	2,524,488
Russia	1,500,854	112,372
United Kingdom	38,355,184	32,951,250

Telegraphic advices from the leading ports indicate that the returns for the month of September will be more encouraging and that the decline in exports, as compared with imports, will be much less. This difference in ratio will be due in a large measure, however, to the fact that our exports were cut off very promptly with the opening of the war early in August, while large quantities of imported merchandise then on the water continued to be received throughout the month.

W. L. C.

Under the new law authorizing commercial attachés of the United States at principal world capitals Secretary of Commerce Redfield has appointed the following: A. T. Harrington, of Ohio, to Lima, Peru; A. H. Baldwin, formerly chief of the Bureau of Foreign and Domestic Commerce, to London; Dr. Albert Hale, now with the Bureau of Pan-American Republics, to Buenos Aires; Edwin M. Thompson, of North Carolina, to Berlin; J. H. Arnold, formerly consul general at Hankow, to Peking; Prof. Lincoln Hutchinson, of the University of California, to Rio de Janeiro; C. W. A. Veditz, of Pennsylvania, to Paris. Seven more are to be named later. The attachés will serve as the Government's business diplomats abroad. They will investigate manufacturing, industrial and trade conditions, and their reports will be made available through the Department of Commerce. Through the State Department they will be accredited to American missions abroad.

The present membership of the American Society for Testing Materials is 1717, a gain of 30 since the last annual meeting.

American Iron and Steel Institute

The indications are that the Birmingham meeting of the American Iron and Steel Institute, Thursday, Friday and Saturday, October 29-31, will be an unusually interesting one. The sessions for the reading and discussion of papers will be held at the Hotel Tutwiler on Thursday and the banquet will be held there Thursday evening. On Friday and Saturday the members of the institute will be the guests of the Tennessee Coal, Iron & Railroad Company, which has arranged a two-day tour by special train to the coal mines, iron mines and iron and steel plants of the Birmingham district. A feature of the trip will be a barbecue on Friday at Bay View.

In case a party of 100 members can be organized in the East, a special train will be run from New York and Philadelphia, leaving New York Tuesday afternoon, October 27.

New Members

The following persons have recently been elected to membership in the Institute:

Active Members

D. B. Baird, superintendent blast furnaces, La Belle Iron Works, Steubenville, Ohio.

Reginald N. Banister, secretary Woodward Iron Company, Woodward, Ala.

Edward Martin Barnes, manager of sales, southern district, Republic Iron & Steel Company, Birmingham.

Thomas Benners, southern sales agent Woodward Iron Company, Birmingham.

George W. Burleigh, director Lackawanna Steel Company, New York City.

Timothy Burns, general superintendent, Pittsburgh Crucible Steel Company, Midland, Pa.

Morris W. Bush, president Shelby Iron Company, Birmingham.

Norris J. Clarke, secretary Upson Nut Company, Cleveland.

Harry W. Coffin, vice-president Alabama Company, Birmingham.

William Edward Collier, salesman Republic Iron & Steel Company, Birmingham.

George W. Conners, president Conners-Weyman Steel Company, Birmingham.

Henry R. deHoll, superintendent by-product coke plant, Inland Steel Company, Indiana Harbor, Ind.

John W. Dix, assistant general manager of sales, Carnegie Steel Company, Pittsburgh.

Victor Everett Edwards, vice-president Morgan Construction Company, Worcester, Mass.

Thomas Bledace Foust, superintendent Warner Iron Company, Cumberland, Tenn.

Jerome H. George, chief engineer Morgan Construction Company, Worcester, Mass.

William J. Gruss, Pickands, Mather & Co., Cleveland.

Thomas M. Jewell, superintendent blooming mill and merchant mills, Wisconsin Steel Company, South Chicago, Ill.

Warren L. Kluttz, vice-president and general manager Central Iron & Coal Company, Holt, Ala.

W. E. Leake, general manager Alabama Co., Birmingham.

John Wood Logan, manager steel works department, Alan Wood Iron & Steel Company, Conshohocken, Pa.

James W. McQueen, vice-president Sloss-Sheffield Steel & Iron Company, Birmingham.

John Campbell Maben, vice-president Sloss-Sheffield Steel & Iron Company, Birmingham.

Frank G. Morris, general superintendent coal mines and coke, Republic Iron & Steel Company, Sayreton, Ala.

Wallace Campbell Moulton, assistant general superintendent Republic Iron & Steel Company, Birmingham.

Eugene C. Morgan, chief engineer Alabama Company, Birmingham.

Paul B. Morgan, president Morgan Spring Company, Worcester, Mass.

Karl Nibecker, steam engineer Youngstown Sheet & Tube Company, Youngstown, Ohio.

Will J. Penhallegon, general superintendent ore mines and quarries, Republic Iron & Steel Company, Birmingham.

John W. Porter, general sales manager Alabama Company, Birmingham.

Lawrence Edward Riddle, general superintendent Isabella and Lucy furnaces, Carnegie Steel Company, Etna, Pa.

George M. Thompson, superintendent Spencer Wire Company, Worcester, Mass.

Willard Wilson, assistant general sales agent Tennessee Coal, Iron & Railroad Company, Birmingham.

A. H. Woodward, vice-president Woodward Iron Company, Woodward, Ala.

Associate Members

Truman H. Aldrich, mining engineer, Birmingham.

H. W. Boland, president Birmingham Machine & Foundry Company, Birmingham.

William M. Byrd, Jr., broker pig iron, cast-iron pipe, etc., Birmingham.

William Hugh Coverdale, consulting engineer Gulf States Steel Company, New York City.

David Evans, president Chicago Steel Foundry Company, Chicago.

Horace Hammond, president Hammond-Byrd Iron Company, Birmingham.

Robert N. McDonough, president McDonough Ore & Mining Company, Birmingham.

Erskine Ramsay, vice-president and chief engineer, Pratt Consolidated Coal Company, Birmingham.

Theodore Swann, sales manager Alabama Power Company, Birmingham.

Frank W. Trabold, sales manager J. H. Williams & Co., Brooklyn, N. Y.

George Tellman Ladd, engineer Republic Iron & Steel Company, Pittsburgh, Pa.

BUDGET MAKING*

Need of Country-Wide Consumption Figures—Factors Not Commonly Taken Care Of

Accurate information regarding the total consumption of the country is sadly lacking in many of the important general lines. Individual makers too often have a mistaken idea that it would injure them if their quantities delivered were known to their competitors. If, however, such information were freely and accurately exchanged each maker would soon be in position carefully and closely to plan his expansion to take care surely of the increasing demands of his customers and obtain his full share of all new business. Each maker would thus avoid unnecessary or premature expenditure for plant which must remain idle for an indefinite time, and each would feel free from the fear that he would fail to supply his trade.

In any industry the producer has, by the simple fact of his production, entered into a contract with the public to supply his goods and to keep on supplying them to the full extent of the public demand. It becomes his duty to prepare for the future and to be ready at the proper time to meet that demand. If each producer does his part there will be no shortage nor any surplus with the evils attendant on each. Since the present state of legislation makes it difficult, if not impossible, for the producers of any given article to exchange information freely it would seem that the Federal authorities could furnish, by means of suitable reports, the combined total production or consumption in an increasing number of industries. These reports made under government authority would in a very short time prove of inestimable value as an aid to that regularity of production which automatically leads to efficiency.

Summarizing the income side of the budget we have sales of product (quantity, average price, amount), income from investments and sundry income. The expenditure side of the budget includes the manufacturing cost of product, general overhead charges and selling expense.

ESTIMATING THE MANUFACTURING COST

Under manufacturing cost we may make as many subdivisions as desired. Generally the following will be found sufficient: The various raw materials; labor; repairs; general expense and sundry items.

A simple and useful method of dealing with raw materials is to have a store account for each. To this account are charged all purchases and all expenses of transportation, handling, unloading, etc., up to the point where the raw material is actually ready for consumption.

Labor employed in manufacture is the only cost item which, under the best conditions, can be purchased from month to month in exactly the right quantity for the production actually made. In practically all the other items there will be from time to time excessive expenditures which will be compensated by deficient outgo at some other time. The store accounts act as a reservoir to receive measured additions and to deliver measured quantities.

DISTRIBUTING COST OF EXTRAORDINARY REPAIRS

In dealing with repairs the same general principle is used in somewhat modified form. The device of a suspense account is found very useful. All current repairs, both labor and material, are charged each month to the cost of production, but in the case of replacement of machinery or apparatus which has had a long life it is evidently unfair to a given month to charge the entire cost of the new work in one lump. Such a course would inevitably lead to great fluctuations in the repairs item from month to month, and thus greatly interfere with the comparative value of the cost figures. To avoid this difficulty the suspense account receives any item deemed of sufficient importance, and each month distributes a properly calculated part to repairs account. Extraordinary repairs, replacements and obsoletion can also be handled in the same manner if desired.

The cost of production may be arbitrarily increased each month by an item to be determined by past experience intended to create a reserve to meet these requirements. Since, however, these are not actual present cash expenditures, it is generally better to omit them from the manufacturing cost statement and to make suitable provision for them either by special appropriation at the end of the year or by an addition to repairs account when the case is presented. In fixing a suitable selling price it is absolutely necessary, however, to consider these items as well as all overhead charges, like interest on bonded debt or capital otherwise borrowed, or dividend on preferred stock, for it is evident that these are as much a part of total cost, as distinguished from bare manufacturing cost, as an expenditure for raw material or labor. No business can expect to thrive which does not carefully cover these fixed items and leave a suitable margin for stockholders.

General expense is too often used as a catch-all for items of all kinds, which on careful analysis could be and ought to be charged to another account in the cost sheet. The difference between productive and non-productive labor must be constantly borne in mind. Here, too, the plan of distributing items from month to month is useful. For example, taxes and insurance frequently are payable in the same month. To charge the product of that month with the entire amount would vitiate all future comparisons. Accordingly, a general expense suspense account receives these and other items, and each month thereafter charges current general expense with the suitable fraction, so that the entire item is exhausted by the end of the proper number of months. The method of suspended accounts has many advantages, but it must be followed with care to prevent abuse. In brief, the idea is to provide a means by which each unit of current product shall stand its proper part, and no more, of every cost item.

MAKING THE BUDGET A BOGEY SHEET

For the annual budget the two most important things to estimate are the possible production cost and the possible selling price. Taking the actual costs attained, it is very useful to prepare an estimated cost on the theory that it is possible in each cost item to approach very closely in the future the best results attained in the past. This standard or "Bogey" sheet is constantly before the officers, who can thus stimulate any department which may show a tendency to fall below the standard. Any considerable departure should be promptly explained. The possible selling price may be closely approximated by determining what it was for the previous year and by ascertaining what it is for the quantities already under contract for the present year. Due allowance must evidently be made for existing tendencies. After only a few years' experience

*Main points of an address made by F. R. Hazard, president Solvay Process Company, Syracuse, N. Y., before the Efficiency Society, Lake Placid, N. Y., September 18.

this estimate can be made accurate to within 2 per cent.

If desired an annual budget may be prepared to show in a progressive manner the expected results for a series of years. This is extremely useful in an industry which shows a steady expansion and in which preparation for future increase in product requires perhaps two or more years of construction work. Such an industry must have its capacity ready when the product is required, but evidently it is only a loss of interest to complete it before the necessity arises. There is also the danger that a plant prematurely erected may become obsolete by the time it is needed.

Pittsburgh and Nearby Districts

At the last bi-monthly settlement of the puddling scale for bar-iron mills in the Central West, the rate for September and October was fixed at $5.60 per ton for mills that sign the Amalgamated scale. The Youngstown Sheet & Tube Company, Youngstown, Ohio, runs its puddling plant non-union, and is paying $6 a ton for puddling, or 40c. per ton above the Amalgamated rate. This action is entirely voluntary on the part of the company.

The Northern Equipment Company, Erie, Pa., manufacturer of boiler equipment, is in the market for a 6-ft. boring mill, either new or second-hand.

The state board of health has approved the plans for a municipal water plant at Sykesville, Pa.

The Crossley Lead & Machine Company, Erie, Pa., has been incorporated with a capital of $15,000. The treasurer is Thomas H. Carroll.

The Automatic Saw Guide & Machine Company, Irwin, Pa., has been incorporated with a capital of $25,000. The treasurer is R. R. McClellan.

H. A. Greiner, receiver of the Buckeye Engine Company, Salem, Ohio, has been authorized by the courts to borrow an amount not to exceed $25,000. He has also been authorized to solicit and receive orders and to use the proceeds of any bills receivable, now or hereafter in his hands, in the operation of the plant in addition to the amount he is authorized to borrow. The money will be borrowed from time to time as the receiver may deem it requisite for the purpose.

No. 3 Bessemer stack of the Republic Iron & Steel Company at Hazelton, Ohio, will probably be blown out in a short time for relining and repairs. This week operations among the plants of the Republic Company in Youngstown, Ohio, are on a larger scale than last week. The Bessemer steel plant and all other departments are on full this week, except the 8-in. hoop, the 12-in. and 20-in. bar mills.

The Pittsburgh Foundry & Machine Company has started work on its new plant on Thirty-sixth street, Pittsburgh. The main building will be 115 x 160 ft., of steel construction, and will be erected by the McClintic-Marshall Company, Pittsburgh. The cranes and other equipment for the new plant have already been bought.

Robert La Mont, president American Steel Foundries, was in Sharon, Pa., last week inspecting the company's works. He says that it will be necessary in a short time to close some of the plants of his company, stating that the attitude of the Interstate Commerce Commission toward railroads is responsible for much of the present depression in the steel business, and he sees no prospects of revival of trade in the near future.

The Wetzel Coal & Coke Company, Fairmont, W. Va., has been incorporated with $2,000,000 capital stock by Josiah V. Thompson, Robert Powell, Charles H. Gorley, and others, of Uniontown, Pa.

The General Fireproofing Company, Youngstown, Ohio, has received a contract for steel furniture, filing cases and other equipment for the new court house being erected at Sacramento, Cal. The contract amounts to about $200,000.

The Humbert works of the American Sheet & Tin Plate Company, South Connellsville, Pa., which has been idle for a long time, is being dismantled. The plant was built by George J. Humbert in 1906, and was operated for some years as an independent works, prior to being taken over by the American Tin Plate Company. The best part of the equipment is being removed to other plants.

Hefner & Maysilles, founders and machinists, Grafton, W. Va., are in the market for a complete iron and brass foundry equipment, a saw table, band saw, jointer, patternmaker's lathe, 24-in. shaper, 20-in. x 10-ft. engine lathe, 150-ton wheel press, 30-in. radial drill, bolt and pipe threading machine, belting, hand tools and supplies. J. H. Maysilles is general manager.

The Vulcan Iron Works, Charleston, W. Va., is asking for prices on a planer, a bolt-cutting machine, a pipe machine and a lathe for its repair shop.

The proposed issue of $1,200,000 in new stock by the Wheeling Steel & Iron Company, Wheeling, W. Va., has been postponed indefinitely because of the uncertainty in the money market due to the European war. An announcement was made a few months ago, following its absorption of the Wheeling Sheet & Tin Plate Company, that $1,200,000 stock at par would be issued, the proceeds to be used in making important improvements, chiefly at the Benwood plant of the company.

The Westinghouse Machine Company is operating its shops at East Pittsburgh, Pa., at nearly normal capacity, with much work on its books. Contracts recently taken include a 1000-hp. steam turbine, with condensing apparatus, from the Erie County Electric Company, Erie, Pa.; a 500-hp. steam turbine, with condensers and motors, from the Union Sulphur Company, Sulphur, La.; two 250-hp. steam turbines from the Laclede Gas Light Company, St. Louis, Mo.; a complete stoker equipment of a 1000-hp. boiler plant from the Wakefield Iron Company, Wakefield, Mich.; a 200-hp. gas engine from Bradford, Pa., and a complete condenser equipment of the Westinghouse LeBlanc type from the Sarnia Gas & Electric Company, Sarnia, Ont.

The Midland blast furnace of the Pittsburgh Crucible Steel Company, Midland, Pa., was blown in last week after being relined and repaired. The stack is expected to make from 450 to 500 tons of basic iron per day, which will be used in the company's open-hearth steel plant.

The Old Meadow plant of the American Sheet & Tin Plate Company at Scottdale, Pa., which has been idle for some time, will probably resume operations within a few days. It has been completely overhauled. The boilers will be fired with fine powdered coke.

Ensley Rail Mill Shut Down

BIRMINGHAM, ALA., September 29, 1914.—(*By Wire.*)—The Tennessee Coal, Iron & Railroad Company has ordered the shutting down of its rail mill at Ensley for about two weeks, resumption prior to October 15 depending upon the receipt of rail orders not now in hand. The blast furnaces, two of the open-hearth furnaces and the Bessemer converters will continue operations. The blooming mill will be run on day turn only. Resumption in the idle departments is promised about October 15 in any event and the plant will be in good running order when the American Iron and Steel Institute meets here.

A patent on a method of manufacturing iron and steel sheets was granted on August 25, No. 1,108,667, to Robert T. Banfield, inspection department of the Carnegie Steel Company. The arrangement of furnaces and mills is planned to keep the roughing mill in operation at all times, so that the roughing mill will relieve the finishing mill of one-quarter of its work, getting that one-quarter more in a finished sheet or that one-quarter more in tonnage at each finishing mill by utilizing the roughing mill to do a portion of the work of the finishing mill.

OBITUARY

CHARLES CHELSEA TAINTOR, Elizabeth, N. J., died September 25, aged 76 years. He was born in Lee, Mass., and at an early age became identified with the building trade. For some years he was a building contractor at Springfield, Ill. He removed to Elizabeth in 1871. About 1878 he entered the employment of David Williams, who was then publishing *The Iron Age*, the Metal Worker and Carpentry and Building, now Building Age. Mr. Taintor not only afforded much practical assistance in the editorial conduct of Carpentry and Building, but also became an advertising solicitor for that paper as well as for *The Iron Age* and the Metal Worker. He was actively connected with these papers up to about 1907. He invented quite a number of mechanics' tools, the best known of which are the Taintor saw set, made by the Taintor Mfg. Company, and a framing tool for carpenters and builders, made by the Taintor Company. He was president of both companies from their inception and up to the time of his death. He was one of the founders of the Central Baptist Church at Elizabeth in 1877. He leaves a widow, a son and a daughter.

FREDERICK A. THUM, Newark, N. J., died September 9, aged 80 years. He was born in Germany, was educated at the Mining Academy of Clausthal, and, according to the Engineering and Mining Journal, gained much practical experience in connection with mines and smelting works in Germany, Belgium, Austria and England. In 1880, at the age of 46, he came to the United States where he identified himself with the smelting and refining works of what is now the Balbach Smelting & Refining Company. Here he accomplished remarkable results in the development of the electrometallurgical refining industry in the United States. He originated the electrolytic treatment of copper bullion and in 1882-3 placed in successful operation the first electrolytic copper refining plant. He leaves two sons, one of whom, William, is superintendent of the Grasselli plant of the United States Metals Refining Company.

JAMES H. ROBINSON, Pueblo, Col., died September 21, after a short illness, aged 56 years. Born in England, he was brought to this country in boyhood by his parents. He was at one time connected with the Cleveland Rolling Mill Company and afterward with steel companies in St. Louis and Chicago. At the time of his death he was chief clerk to Frank E. Parks, assistant manager of the Colorado Fuel & Iron Company. He leaves a widow, four sons and three daughters.

LEVI H. MONTROSS, president Montross Metal Shingle Company, Camden, N. J., died September 23, aged 72 years. He was the inventor of the metal shingle and the founder of the business which bears his name. He is also said to have been the first man to make a metal burial casket and was the inventor of a talking machine. He leaves a widow, two sons and a daughter.

Gisholt Machine Company Selling Changes

The Gisholt Machine Company, Madison, Wis., announces changes in its selling arrangement. J. E. Brandt, who has heretofore represented the company in the Philadelphia territory, has associated himself with the Swind Machinery Company, of Philadelphia, and this company has been appointed a Gisholt agency in the Philadelphia territory. The Gisholt Company has also appointed J. L. Osgood, of Buffalo, as its agent in the Buffalo and Rochester territory. R. D. Heflin, who has heretofore represented the company in the New England territory, making his home at Hartford, Conn., is now in charge of its New York office and will look after Gisholt business in both the New York and New England territories. Ellis F. Muther, formerly Eastern sales manager, with headquarters at New York, has been appointed general sales manager, in charge of general sales and advertising work and will make his headquarters at the Madison, Wis., office.

Mining Engineers' Pittsburgh Meeting

The Pittsburgh meeting of the American Institute of Mining Engineers will be held at the Hotel Schenley, with the first session on Thursday afternoon, October 8, at 2.30 p. m., and three simultaneous sessions on both Friday and Saturday mornings. Friday afternoon is reserved for excursions to the Homestead steel works of the Carnegie Steel Company, the McKeesport plant of the National Tube Company, the experimental mine at Bruceton, and the brick factories of the Harbison-Walker Refractories Company.

The following are some of the papers scheduled, the sessions on Friday morning covering, besides iron and steel, papers on coal and coke and on non-metallic minerals, and on Saturday morning on petroleum and gas and on electricity and miscellaneous mining topics.

Thursday, October 8, 2.30 p.m.

"The Occurrence, Preparation and Use of Magnesite," by L. C. Morganroth, Pittsburgh.

"The Oil Fields of Mexico," by Ezequiel Ordoñez, Mexico City.

"The Iron Industry in Brazil," E. C. Harder, United States Geological Survey, Washington.

"Investigations of Coal-Dust Explosions," by G. S. Rice, United States Bureau of Mines, Pittsburgh.

"The Appraisal of Coal Lands for Taxation," by H. M. Chance, Philadelphia.

"Ancient Methods of Manufacture of Iron in China," an illustrated lecture at 8.30 p.m. by T. T. Read. This will be followed by motion pictures of safety methods in mining, provided by the United States Bureau of Mines.

Friday, October 9, 9.30 a.m.

"The Reserves of Iron Ore for the United States," by J. Birkinbine, Philadelphia.

"Finishing Temperatures and Properties of Rails," by G. K. Burgess, J. J. Crowe, H. S. Rawdon and R. W. Waltenberg.

"The Plant of the Duplex Process for Making Steel," by J. K. Furst.

"Manganese Steel and the Allotropic Theory," by Professor Albert Sauveur, Harvard University.

"The Manufacture of Coke" (Coal and Coke Session), by J. P. K. Miller.

Saturday, October 10, 9.30 a.m.

"Rolled Steel Roll Shells," by J. C. H. Ferguson, San Francisco.

"Surface Decarbonization of Tool Steel," by J. V. Emmons, Cleveland.

"Turbo Blowers for Blast Furnace Blowing," by R. H. Rice, General Electric Company.

"The Safety Movement in the Lake Superior Iron Region," by Edwin Higgins, United States Bureau of Mines, Ironwood, Mich.

"A New Safety Detonating Fuse," by Harrison Souder, Cornwall, Pa.

Bollinger Brothers Completing New Plant

Bollinger Brothers, engineers and contractors, Fulton Building, Pittsburgh, have nearly completed the erection of the main building of their new plant at Ambridge, Pa. Cranes and other equipment are being installed and the works will be ready for operation in about a month. The erection of two more buildings, each about 120 x 240 ft., will be started at once. When the new plant is entirely completed, the equipment of the old works at Newell, Pa., will be moved to the new plant. In the meantime the old works at Newell and the new works at Ambridge will be operated. The buildings of the new plant are of steel frame and brick construction, with metal sash running clear to the roof, thus affording maximum light and ventilation. All machinery will be operated by electric power, central station current being used. Bollinger Brothers are manufacturers of coal-washing equipment and also manufacture and erect all kinds of coal-handling machinery, including tipples, car hauls and screening and loading equipment.

The Nittany blast furnace at Bellefonte, Pa., which has been out of blast for several years, has been sold on behalf of the bondholders to a firm which will dismantle it, selling the equipment and steel work as second-hand machinery or as scrap.

Compensation Acts and Industrial Diseases

Courts Hold That Disability or Death Is Subject to Award as Personal Injury but Not as Accident

BY A. L. H. STREET

Do the workmen's compensation acts provide for awards for death or disability of employees resulting from occupational diseases? This important question is being propounded to the courts of last resort and a difference of opinion is found to result. For instance, the Supreme Court of Michigan has just decided that, in enacting the compensation law in that State, "it was not the intention of the Legislature to provide compensation for industrial or occupational diseases, but for injuries arising from accidents alone." (Adams vs. Acme White Lead & Color Works, 148 Northwestern Reporter 485.) This decision was announced in a case involving the question whether the defendant was liable, under the compensation act, for the death of an employee in a red lead plant, caused by lead poisoning contracted while he was at work. On the other hand, the Massachusetts Supreme Judicial Court decided a few weeks ago, in a similar case, that the Massachusetts compensation act does extend to occupational diseases. (Johnson vs. London Guarantee & Accident Company, 104 Northeastern Reporter 336.)

The Michigan court reconciled the two decisions on the ground that the Michigan law provides only for compensation for "accidents," while the Massachusetts act extends to all "personal injuries" sustained by employees in the course of their employment.

Summarized, the reasoning of the Michigan decision is as follows: The paramount object of workmen's compensation laws is to supplant the common-law remedy for the compensation of workmen for accidental injuries received in the course of their employment, by taking away the defenses of contributory negligence, excepting willful negligence, of assumption of risk, and of negligence of a fellow employee. In this connection, the term "personal injury" must refer to common-law conditions and liabilities "and does not refer to and include occupational diseases, because an employee had no right of action for injury or death due to occupational diseases at common law, but, generally speaking, only accidents, or, rather, accidental injuries, gave a right of action. * * * Certainly it can be said that in this State no employer has ever been held liable to the employee for injury from an occupational disease, but only for injuries caused by negligence." The court then proceeds to review salient provisions of the Michigan compensation law and the statute under which the law was proposed by a commission, to show that it was the legislative intent to confine awards to accidental injuries. A decision under the English law is cited to show that it gave no right to compensation for disability caused by industrial disease, until the act was amended in 1906 so as to expressly provide for such compensation.

The Michigan Supreme Court concludes: "If it is said that it is just as important to protect employees against such conditions as are here presented as it is to protect them against injuries arising from what are strictly termed 'accidents,' our answer is that that is a matter which should be addressed to the Legislature. In the absence of a provision in the statute meeting this situation, the court is unable to award a recovery."

The court cites a recent decision by a New Jersey court of common pleas to the effect that the New Jersey compensation act does not authorize an award for copper poisoning, caused by contact with copper filings and inhaling the dust from them by an employee in his work in grinding and polishing brass products. Although it is pointed out by the Michigan Supreme Court that the New Jersey law is similar to that of Massachusetts, it is admitted that the New Jersey decision is not authoritative, because not announced by a court of last resort.

Turning to the Massachusetts law, it was decided by the Supreme Judicial Court of that State In re Hurle, 104 Northeastern Reporter 336, that an employee, who was totally incapacitated for work by losing his sight as a result of an acute attack of optic neuritis induced by poisonous coal tar gases which he inhaled in the performance of his duties about a furnace, was entitled to an award. The court said: "The question to be decided is whether this was a 'personal injury' arising out of and in the course of his employment. * * * Unquestionably it arose out of and in the course of his employment. The only point of difficulty is whether it is a 'personal injury.' * * * There is nothing in the act which leads to the conclusion that 'personal injuries' was there used in a narrow or restricted sense. * * * The noxious vapors which caused the bodily harm in this case were the direct production of the employer. The nature of the workman's labor was such that they were bound to be thrust in his face. The resulting injury is direct. If the gas had exploded within the furnace and thrown pieces of cherry-hot coal through the holes into the workman's eyes, without question he would have been entitled to compensation." The court admits, however, that if "accident" had been the decisive word in the law, instead of "personal injuries," the decision might have been different.

In reaffirming this decision in the case of Johnson vs. London Guarantee & Accident Company, above referred to, the Massachusetts Supreme Judicial Court holds that when an occupational disease results in an employee's disability after the taking effect of the compensation act, it is no defense to a claim to compensation that the disease commenced to take effect before the law was enacted.

To prevent delay and inconvenience to its customers occasioned by the interruption of communications with its Berlin factory, on account of the war, the Hess-Bright Mfg. Company, Front street and Erie avenue, Philadelphia, Pa., is having bearings manufactured by outside parties. It is stated that this work is being done in accordance with the company's specifications and is subject to the same inspection as the bearings received from Berlin. At the present time bearings are being shipped from abroad, but this independent basis of manufacturing is being proceeded with to prevent any shortage from occurring.

One of the Lock Ridge furnaces of the Thomas Iron Company at Alburtis, Pa., has been put in blast.

PERSONAL

Adolph Greiner, president of the Iron and Steel Institute, who is general manager of the Cockerill steel works at Seraing, Belgium, near Liege, has been released by the German military authorities his friends in the United States will be glad to hear. The Germans placed M. Greiner under arrest because he refused to run the plant on behalf of the German authorities. The Germans then endeavored to work the establishment themselves, accompanying the substantial increase in wages which they offered with warnings to employees who neglected their duties or who impeded the output in any way.

The successor of D. T. Williams, who recently resigned as president of the D. T. Williams Valve Company, Cincinnati, Ohio, is Robert E. Mullane, who will have the titles of president and treasurer. Frank X. Pund, formerly with the Republic Iron & Steel Company, is vice-president of the company.

W. S. Matheson, for eight years chief estimator and sales manager of the Seattle Construction & Drydock Company, has become manager of the Westerman Iron Works, Seattle, Wash.

L. L. Knox, president Knox Pressed & Welded Steel Company, Pittsburgh, was painfully but not seriously injured in an automobile accident near Pulaski, Pa., last week, and is now confined to his home.

R. W. Benson, formerly general sales manager of the American Flexible Bolt Company, Union Bank Building, Pittsburgh, is now in charge of its general sales offices, which were removed some time ago from Pittsburgh to 50 Church street, New York City.

Frederick W. Brill, general sales manager for the American Car Company, St. Louis, has resigned to accept a position with the J. G. Brill Company at Philadelphia. A complimentary dinner was given him by his associates September 24, at which time the presentation of a gold watch and chain was made.

Don F. Kennedy, who has traveled for the Union Drawn Steel Company in the last five years through New York and New England, has resigned to become identified with the Line-a-Time Mfg. Company, Inc., Rochester, N. Y. He will handle this company's machine, which is used in connection with typewriters, in the State of Michigan, with offices in the Dime Bank building, Detroit.

Dr. Edward Ewing Pratt, for some time manager of the Industrial Bureau of the Merchants' Association of New York, has been appointed by President Wilson chief of the Bureau of Foreign and Domestic Commerce, Department of Commerce, succeeding A. H. Baldwin who has resigned to become commercial attaché of the American mission at London.

D. Brewer Gehly, heretofore secretary of the Cambria Steel Company, has been elected treasurer in place of Alex. P. Robinson, who resigned on account of ill health, but remains vice-president. Mr. Robinson has been given an extended leave of absence.

Tracy W. Guthrie, formerly president of the Republic Iron & Steel Company and later general manager of the Standard Welding Company, Cleveland, Ohio, has become a member of the reorganization committee of the United Coal Company, Pittsburgh, Pa., and has moved from Cleveland to Sewickley, a Pittsburgh suburb.

Louis Koppenhoefer is now the majority stockholder and secretary and treasurer of the Par-Kop Mfg. Company, 1011 Master street, Philadelphia, manufacturer and dealer in automobile specialties, Parker vaporizers, Keep-New varnish and shock absorbers, formerly at Broad street and Ridge avenue, Philadelphia.

William H. Davey has resigned as vice-president and general manager of the Massillon Rolling Mill Company, Massillon, Ohio, to become general manager of a new company that will operate the plant of the National Rolling Mill Company, Mansfield, Ohio. He is one of the best known men in the sheet-making industry in the United States, having at different times been superintendent of the plant of the Reeves Mfg. Company, Canal Dover, Ohio, general superintendent of the McKeesport Tin Plate Company, general superintendent of the Carnahan Tin Plate & Sheet Company and connected with the Berger interests in Canton and other sheet-steel companies. Associated with him at the Mansfield plant will be his seven brothers, one of whom, Samuel Davey, will be superintendent.

J. M. Jones, for some years connected with the Lalance & Grosjean Mfg. Company, Harrisburg, Pa., has been appointed general manager of the Massillon Rolling Mill Company, Massillon, Ohio, effective November 1. He succeeds W. H. Davey.

D. H. Oskin has been appointed general manager of sales of the Trumbull Steel Company, Warren, Ohio, succeeding G. T. Thomas, who recently resigned.

T. B. Van Dorn has been elected president of the Van Dorn Iron Works Company, Cleveland, Ohio, succeeding his father, J. H. Van Dorn, who died recently. He has been vice-president of the company about 20 years.

James C. Wallace resigned as president of the American Shipbuilding Company, Cleveland, Ohio, at a meeting of the board of directors September 23, and Edward Smith, Buffalo, N. Y., president of the Buffalo Dry Docks Company and Great Lakes Towing Company, was elected to succeed him. M. E. Farr, president and treasurer of the Detroit Shipbuilding Company, succeeds Mr. Smith as vice-president.

Southern Pig-Iron Rate Reduction Not Made by All Roads

Considerable confusion in the pig-iron trade has resulted from the action of Southern railroads in issuing their tariff supplement on pig iron from the South to Central Freight Association territory. It had been understood in the trade that the Interstate Commerce Commission's ruling contemplated a reduction of 35c. a ton, effective October 1, to all points in Central Freight Association territory. It developed that the complaint brought by the Sloss-Sheffield Steel & Iron Company et al. vs. the Louisville & Nashville Railroad Company et al. failed to mention the Baltimore & Ohio Southwestern Railroad, the Cincinnati, Hamilton & Dayton and the Cleveland, Cincinnati, Chicago & St. Louis, or Big Four. The commission's order applies only to points reached by the railroads specifically mentioned in the complaint. Thus a number of important consuming points in the North are exempt from the order, such as Fort Wayne, Marion and Kendallville, Ind., Addyston, Ohio, and all of Michigan territory. Already Cincinnati pig-iron sellers have come upon cases in their trade where the old rates are still effective, though deliveries of pig iron were specified to be made after October 1 so as to get the benefit of the reduced rates.

While the new rates of the roads not made parties to the Sloss-Sheffield case are in accordance with the Interstate Commerce Commission's rule, the opinion is expressed that these roads are taking a technical advantage of the situation and that the intent of the commission's ruling was plain. Both the railroads which were ordered to make reductions and the consumers of pig iron in territory affected are interested in having the decision made applicable to all roads, and it is understood the Interstate Commerce Commission will be asked to make such an order.

In accordance with the Interstate Commerce Commission's finding of early July, the new rates of the roads included in the order, to Cincinnati, Louisville, Chicago, Cleveland and other Central Western points, represent a reduction of 35 cents. The Cleveland and Chicago rate from Birmingham thus becomes $4; the rate to Cincinnati, $2.90; to Louisville, $2.65, and to Pittsburgh, $4.55. In New England, greater reductions are made in a number of cases. The commission ordered a $5 rate to Lowell, as against $5.85 formerly, and $5.25 to Portland, Me., and Springfield, Mass., to which the old rate was $6.

The Machinery Markets

Contracts for war materials which have been placed in this country have led to the giving of some exceptionally good orders for machine tools by companies in the eastern states. Inquiries from other manufacturing interests continue to come out more plentifully and the opinion is that only a little picking up in business, with easier money, will start a good buying movement. These indications and others serve to maintain the optimism of the trade. New York reports some good sales to arms and projectile makers and general inquiry has improved. In New England orders which will keep certain plants busy for several months have been received as a result of the war and financial and other conditions have improved. In Chicago also war needs are creating business, though not to the same extent as in other territories. The inquiry for machine tools is better in Milwaukee. Inquiry is showing more life in Detroit and sales are not so difficult to close. Cleveland conditions are slightly better, both as regards domestic and foreign business. In the Central South the demand continues quiet for equipment of all kinds. The feeling in St. Louis is improving and a hopeful sign is better prices for cotton and its more active movement out of the first-hands. Texas also reports a betterment in the cotton situation which will be reflected in the machinery trade. Although the machine tool trade is inactive on the Pacific Coast, confidence is inspired by the fact that the August imports in the district of Washington were greater than those of the same month last year. In San Francisco inquiries for machinery are taking more definite shape.

New York

NEW YORK, September 30, 1914.

Some exceptionally good sales of machine tools are reported in this market as a result of foreign demand upon makers of war materials and this has had a cheering effect on manufacturers' representatives, despite the fact that the trade at large is not directly benefited. One of these sales involved 68 milling machines, the purchaser being a maker of arms and ammunition in New York State, who has been contemplating the purchase and probably has acquired other machine tools. The Bethlehem Steel Company was a recent purchaser of a number of automatic screw machines. Most of the companies who have war business are not saying much about it. After canvassing industrial prospects salesmen are invariably of the opinion that even a small betterment in business conditions will start a buying movement and they are particularly hopeful regarding the automobile industry, which is believed to have great opportunities for export before it. The foreign trade in the cheap and medium-priced cars is expected to break records. At the present time a Pennsylvania maker is busy turning out armored cars for the English army. The railroads continue to do but little buying of any sort.

The Binghamton Bridge Company, 1008 Press Building, Binghamton, N. Y., which has purchased the property of the Ingalls Stone Company, is equipping it throughout with electrically driven machines. C. S. Mallery is president and Matthew Walpole is shop manager.

The foundry of Andrew N. Petersen, Williamsburg, N. Y., which was recently destroyed by fire with a loss of $70,000, is to be rebuilt at once.

The pattern and tool rooms of the plant of the Johnston Harvester Company, Batavia, N. Y., will resume operations Monday, October 5, and the re-opening of the entire plant will follow a little later.

The Ritter Dental Mfg. Company, 406 West avenue, Rochester, N. Y., has let contracts for alterations and additions to its plant, to cost $30,000.

The James A. Spargo Wire Company, Rome, N. Y., has increased its capital stock from $50,000 to $200,000.

The plans which are being drawn for a factory for the Benford Mfg. Company, Mt. Vernon, N. Y., manufacturer of spark plugs, call for a four-story building, 40 x 110 ft.

The Buffalo Air Brush Company, Buffalo, has been incorporated to manufacture air brushes, sprinklers, fans, stampings, etc. F. Ruppel, T. McCall and J. A. Stinehart, Buffalo, are the incorporators. The capital stock is $50,000.

The Buffalo & Niagara Falls Electric Light & Power Company will proceed with the erection of a transformer house and distributing station, 60 x 80 ft., and a storage house and garage, 60 x 80 ft., on Ferry and Walnut streets and the Erie Railroad, Niagara Falls, N. Y. The cost will be $60,000.

A one-story building, 162 x 300 ft., is being added to the plant of the Cortland Carriage Goods Company, Cortland, N. Y. Bids are being taken for the machinery and equipment required.

The J. Lawrence Hill Company, Cambridge street and Park avenue, Rochester, N. Y., manufacturer of carriages and motor cars, will continue the manufacture of its present lines and will not produce batteries or their parts, as has been reported elsewhere. It will add to its factory equipment. J. Lawrence Hill is president.

The Beaver Leather Mfg. Company, 440 Frelinghuysen avenue, Newark, N. J., is building a factory for the manufacture of shoe leather.

New England

BOSTON, MASS., September 29, 1914.

No reason exists for changing the statement made last week that manufacturers and bankers are confident that business will increase gradually but surely from now on. The money market is improved and the effect is already slightly apparent in this territory. The war is having a very direct influence in increasing the activities of certain branches of manufacturing industry. A great many lines including a large number of metal products have been in keen competition with imported goods and the withdrawal of the latter from the market has resulted in orders which otherwise would have been placed with foreign concerns. Of course, a great many workmen are idle, but the tide is probably at the lowest ebb and the winter should not be so disastrous a one for labor as some commentators would lead one to believe. The machine tool people are hit hardest of anybody, but they are bound to see some improvement. A few of them have been given large orders for machinery which will for the most part be used in the manufacture of munitions of war. All this helps out. The Pratt & Whitney Company, Hartford, Conn., builds a broad line of metal-working machinery. As stated elsewhere in this issue, these works will be busy for a year, if no additional business is booked in the meantime. A builder of drilling machines has sold everything that he has in stock. These are not wholly exceptional instances. Therefore, it may be deduced that stocks, which have not been large for some time, are being still farther reduced. And every shop that gets to a place where it cannot immediately supply a new demand, including that from domestic uses, makes the situation that much better for other machinery builders.

In New England the textile business is constantly discussed. The woolen business is good and so are the silk and lace and narrow fabric industries. The cotton business is still dull, but the average experienced observer believes that within a few months the great mills, employing tens of thousands of people, will be running at full capacity. As Europe is taking little of our raw cotton, it is perfectly fair to deduce that the American mills will have to enter the field, else there will be an enormous deficit in the world's supply of cotton cloth.

George F. Fuller has resigned as president of the Reed-Prentice Company, Worcester, Mass., and Lucius J. Knowles has been elected to fill that office. Albert E. Newton has been re-elected vice-president and general manager, and George Crompton treasurer. The board of directors remains unchanged, and consists of President Knowles, the treasurer of the Crompton & Knowles Loom Works; George F. Fuller, general manager of the Wyman & Gordon Company; Mr. Newton, Mr. Crompton, Charles M. Thayer, Homer Gage, George Lee, of Lee, Higginson & Co., Boston, and Harry W. Smith.

The stock and equipment of the Reynolds Screw Company, 321 East street, New Haven, Conn., will be sold at auction Wednesday, October 7.

The Osborne & Stephenson Mfg. Company, Plainville, Conn., has increased its capital stock from $25,000 to $50,000. The new capital covers the cost of machinery already installed and some other miscellaneous equipment which will be purchased in the near future.

The Federal Engineering Company, West Newton, Mass., has been organized to manufacture a self-starter and other automobile specialties. Roland F. Gammons is the treasurer. The company states that it has made factory arrangements which will not require the purchase of equipment.

The new building of the Standard Nut & Bolt Company, Valley Falls, R. I., will be used for the office and the shipping department. The company states that it will require no machinery at present.

Isaac Friedman will build a five-story brick and stone factory at Mill and Margin streets, Salem, Mass., to cost $40,000.

The White Mountain Freezer Company, Nashua, N. H., will erect a saw mill and stave mill on land recently purchased.

The Union Mfg. Company, New Britain, Conn., will build a five-story addition which will occupy the site of the wooden building which is occupied in part by the office.

Philadelphia

PHILADELPHIA, PA., September 28, 1914.

The Tinius Olsen Testing Machine Company, 500 North Twelfth street, Philadelphia, manufacturer of presses, etc., is building an addition to provide for increased business. Tinius Olsen is president.

The Lifter Ice Cream Company, 222 Lombard street, Philadelphia, is receiving bids on a three-story brick and concrete addition to its factory, 80 x 141 ft. Anderson & Haupt, Drexel Building, are the architects.

A permit has been granted the Philadelphia Paper Mfg. Company, River road, Philadelphia, for the erection of a one-story brick boiler house at Nixon and Fountain streets at a cost of $20,000.

Plans have been drawn by State Architect George S. Drew, Trenton, N. J., for a power house for the New Jersey State Home for Feeble-minded Women, care of Doctor Hollowell, Vineland, N. J., to cost complete with additional boiler, $30,000.

M. F. McFadden, 1409 Mulberry street, Scranton, Pa., manufacturer of ice cream, is enlarging his plant. He will install a 50-ton compressor and other machinery to cost about $10,000.

The City Dairy Company, 520 North Calvert street, Baltimore, Md., is having plans prepared for a dairy and ice cream plant for its Gardiner Dairy branch, including a one and two-story main building, 103 x 320 ft., a garage and repair shop 63 x 200 ft., and a power house 80 x 105 ft. A 700-ton ice-making machine will be installed. Asa B. Gardiner, Jr., is president.

The Chapin-Sacks Mfg. Company, Washington, D. C., manufacturer of ice cream, etc., has commissioned the C. D. Cooley Company, Century Building, Pittsburgh, Pa., architect and engineer, to draw plans for an ice cream plant to cost about $400,000. It will consist of a garage, wagon repair shop, auto repair shop, ice cream manufacturing plant, additional ice-making machinery, power plant, etc. One group of buildings will be 250 x 285 ft., the other 90 x 450 ft.

Chicago

CHICAGO, ILL., September 28, 1914.

As has been expected, the war needs of European governments have resulted in a number of orders to machine tool manufacturers in this country, but it is quite apparent that such business as has been placed contains no other significance. This territory has been less favored with this class of business than other districts where makers of special tools suitable to arsenal requirements are located. Local machinery interests are really having a much more limited foreign demand for their product than under normal circumstances. Domestic inquiry continues exceedingly light and sales are few and scattered. Canvassing for orders has borne so little fruit of late that some of the local dealers have temporarily withdrawn their salesmen from the field.

The Peoples Coal & Ice Company, 108 East Fourth street, St. Paul, Minn., is considering the erection of an artificial ice plant to cost about $100,000 and is receiving estimates from manufacturers of ice-making machinery. J. J. Elliott is manager.

F. D. Chase, 122 South Michigan avenue, Chicago, is taking bids for a brick and steel one-story foundry to be built at Hoopeston, Ill., at an estimated cost of $40,000.

The Anderson Engine Company, 4034 North Rockwell street, Chicago, manufacturer of marine engines, is in the market for a traveling crane to be installed in its erecting floor.

Robert M. Fair has recently purchased the premises at 445-59 West Erie street, Chicago, with a frontage of 150 ft. and depth of 100 ft. The property is improved with a two-story and basement brick building, occupied by Frank Voightman & Co., manufacturers of metal windows and doors, who have taken a lease for 25 years. Four additional floors will be added to the structure.

The Chicago Auto Equipment Company, Chicago, has been incorporated with a capital stock of $2500 by Harold M. Behan, Emil Fantana and W. H. Dellenback, 105 North Clark street.

The Anchor Brake & Mfg. Company, Chicago, manufacturer of brake shoes and railroad supplies, has been incorporated with a capital stock of $50,000 by Arthur M. Kracke, Edmund P. Kelly and Richard G. Brennan, 209 South LaSalle street.

The Century Auto Top & Supply Company, Chicago, has been incorporated with a capital stock of $10,000 to manufacture and deal in auto accessories. The incorporators are B. M. Goff, B. M. Govy and C. A. Wever, 5635 Calumet avenue.

The Johnson & Meier Company, Chicago, has been incorporated with a capital stock of $8000 to manufacture and deal in brass, bronze, iron, etc. Edward Johnson, Charles A. Meier and William P. Thornton, 133 West Washington street, are the incorporators.

The factories of F. R. Leonard & Co., and Leonard & Leonard, manufacturers of automobile parts and wagon stock, Metropolis, Ill., were destroyed by fire.

The Arrow Engineering Company, St. Louis, was awarded the contract for the construction of the Palmyra, Ill., light and water plant.

The Simplex Ventilating Company, Jerseyville, Ill., has been incorporated with a capital stock of $5000 to manufacture and deal in window ventilators, etc. T. W. Butler, F. D. Heller and A. A. Shobe are the incorporators.

The contract for the municipal power distributing station of Aurora, Minn., has been awarded to the Great Northern Power Company for $20,405. Work on the structure will be completed this fall. The village will own the building but the company will supply the power.

F. & A. S. Dusenburg, Des Moines, Iowa, manufacturers of engines and cars, state that they have not definitely decided to remove to Dallas, Ill.

The Bemidji Welding & Machine Company, Bemidji, Minn., which has been organized by C. F. Olson, Litchfield, Minn., has purchased a factory. It will be fully equipped for machine work and oxy-acetylene welding or cutting. It is now in the market for a good second-hand 32-in. x 18-ft. lathe and small tools, such as drills, milling cutters, reamers, etc.

Detroit

DETROIT, MICH., September 28, 1914.

Business with machine-tool dealers is about the same as last week but the appearance of the market continues to improve. Inquiry displays more life, the volume shows some increase and sales are not so difficult to close. There is a change for the better among manufacturers; some plants which have had little to do during the summer are now receiving a fair volume of orders and in practically all metal-working lines conditions show more or less of an improvement. The uncertainty of securing financial aid seems to be holding back a considerable amount of business and if the situation in this respect is cleared up business will receive a sharp impetus. The volume of new construction work shows a considerable decrease.

The Detroit Trust Company has been appointed temporary receiver of the Lozier Motor Company, Detroit, and the entire plant of the company, with the exception of the service department, has ceased operations. Efforts are under way to effect a reorganization of the company so that business can be resumed at an early date.

The Detroit Electrical Devices Company, Detroit, has been incorporated with a capital stock of $20,000 by T. A. Tanner, E. D. Byrnes, J. F. Cullin, and others. It will engage in the manufacture of automobile accessories.

The National Motor Appliances Company, Detroit, has been incorporated with $25,000 capital stock to manufacture motor appliances, gas engines and accessories. The incorporators

are Sidney B. Winn, Nathan H. Jewett and Howard Streeter.

The Wadsworth-Campbell Box Company, Detroit, has been organized with $30,000 capital stock to take over the business formerly conducted by T. A. Wadsworth, 379-385 Monroe avenue. The principal stockholders are John A. Campbell and Harold L. Wadsworth.

The Scripps-Booth Cyclecar Company, Detroit, has changed its name to the Scripps-Booth Company and has increased its capital stock from $50,000 to $150,000. It proposes to engage in the manufacture of automobiles.

The Chatfield Milling Company, Bay City, Mich., will add 5000 sq. ft. to its present plant and will install additional machinery.

The Commonwealth Power Company, Jackson, Mich., has asked the state railway commission for authority to issue bonds to the amount of $521,000 for extensions and improvements. The bond issues will be apportioned as follows: Au Sable Electric Company, $272,000; Commonwealth Power Company, $131,000; Grand Rapids-Muskegon Power Company, $81,000, and the remaining $34,000 divided between six subsidiary companies.

Fire destroyed the Phillips screen making plant at Fenton, Mich., with a loss of $100,000. It was occupied by the Henry C. Koppin Company, Detroit, manufacturer of screens and house furnishings, and by the Fenton Cycle Car Company.

Milwaukee

MILWAUKEE, WIS., September 28, 1914.

A noticeable improvement in inquiry for machine tools and special machinery has set in; but whether or not any amount of actual business will result is a matter of doubt and not too much confidence is being placed in the situation. A few small orders have been booked the past week and business can be said to have improved slightly. Power machinery demand is somewhat better, but most of the buying is on municipal water or electric utility account. Payrolls are being maintained well and employers are considering increases by taking on men laid off in the last six months. On the whole more confidence is shown than for some time.

The following bids for the improvement of the waterworks system at the county institutions in Wauwatosa are being called for until 2 p. m., October 6: Bid A, for an extension of present power plant; bid C, for a 250-hp. horizontal water-tube boiler; bid E, for a 2,500,000-gal. crank and flywheel pumping engine, and bid F, for a 2,500,000-gal. direct-acting duplex pumping engine. Plans were prepared by the Thomas S. Watson Company, engineer, 1412 Majestic Building, Milwaukee. Walter Schinz is secretary of the board of trustees.

The Invincible Metal Furniture Company, Monroe, Wis., has accepted the offer of the Citizens' Association, Manitowoc, Wis., for larger factory space and improved transportation facilities and will remove to Manitowoc. It will occupy the former plant of the Manitowoc Mattress Company at Twenty-sixth and Franklin streets. The capital stock will be increased from $20,000 to $50,000.

The Dornfeld-Kunert Company, Watertown, Wis., manufacturer of boilers and machinery, has been adjudicated a bankrupt in the federal court at Madison, Wis.

Articles of incorporation have been filed by the Tigerton Electric Company, Tigerton, Wis., with a capital stock of $10,000 by J. C. Mueller, Louis Bucksieb and T. Swanke. It will establish an electric light and power plant.

The estate of Balthasar Hoffman, Milwaukee, Wis., chief owner of the B. Hoffman Mfg. Company, manufacturer of machinery, pipe, etc., has been incorporated under the style of the B. Hoffman Estate with a capital stock of $40,000. Balthasar Hoffman, Jr., is the incorporator.

W. L. Friday, Beaver Dam., Wis., is making plans to manufacture patented farm machinery, including a harvesting machine for peas, beans, and similar products. The machine is driven by a four-cylinder gasoline engine.

The Marathon Electric Mfg. Company, Wausau, Wis., recently organized, has started operations in its new factory. An addition, 25 x 25 ft., is being made to the building for forge and boiler house purposes.

The McDonough Mfg. Company, Eau Claire, Wis., manufacturer of sawmills and mill equipment, has received orders to postpone shipment of machinery and equipment for three large sawmills in Louisiana, contracts for which were placed early this year. The buyers say they have been obliged to postpone construction and effect retrenchment because the Southern lumber trade is at a standstill. England and Germany furnish the largest market for Louisiana lumbermen and this exportation is now entirely cut off.

The United Refrigerator & Ice Machine Company, Kenosha, Wis., has asked its creditors to meet its officers to consider the financial situation brought about by the suspension of the Commercial & Savings Bank of Racine, Wis., in which the Kenosha concern carried a long line of credits. The company is in good shape and the movement is made to avoid action by any creditors.

Frank D. Fosha, Green Bay, Wis., has broken ground for a garage and service station, 50 x 100 ft., of reinforced concrete.

The flour mill and hydroelectric plant of M. Mortensen, Cazenovia, Wis., which served the village, was badly damaged by fire last week. Mr. Mortensen plans to rebuild.

Milwaukee machinery builders are bidding on the requirements of the city of Ely, Minn., for one cross-compound Meyer gear crank and flywheel pumping engine of 1,500,000-gal. capacity; one 100-kw. alternating current engine type generator, and one steam engine to operate generator, direct-connected. Plans were prepared by W. C. Buck, consulting engineer, Minneapolis, Minn. Bids close October 5. I. Wisted, Jr., is city clerk.

W. R. Stelter, Fall Creek, Wis., will start work on a garage and machine shop. A small list of tools will be required.

The Orfordville Light & Power Company, Orfordville, Wis., has been granted a franchise to erect a lighting plant.

The Burkhardt Milling & Electric Company, Burkhardt, Wis., has purchased the water power and plant of the Baldwin Electric Light & Fuel Company, Baldwin, Wis., and will spend about $7000 in installing additional hydroelectric equipment.

Indianapolis

INDIANAPOLIS, IND., September 28, 1914.

The Perfection Spring Wheel Company, Indianapolis, has been incorporated with $50,000 capital stock to manufacture wheels. The directors are Harry Weill, Max Weill and George V. Stein, Indianapolis, and Austin Cabel and Bret Cabel, Washington, Ind.

The general offices of the American Rotary Valve Company are to be moved from Chicago to Anderson, Ind., where the company has its largest plant.

Fire practically destroyed the plant of the Garden City Tablet Company, Elkhart, Ind., September 19, causing a loss in machinery and stock of $100,000.

The Terre Haute Tent & Awning Company, Terre Haute, Ind., has been incorporated with $10,000 capital stock to manufacture awnings. The directors are William E. Kautz, Roy C. Myers, Terre Haute, and Frank Sanders, Indianapolis.

The Babcock Brass Company, South Bend, Ind., has been incorporated with $15,000 capital stock to manufacture metal articles. The directors are Martin L. Williams, Royal E. Babcock and John P. Russell.

The Telbax Company, Mishawaka, Ind., has been incorporated with $100,000 capital stock to manufacture amusement games. The directors are John W. Culp, D. N. Culp and N. M. Zorcher.

Cleveland

CLEVELAND, OHIO, September 28, 1914.

Conditions in the machinery market are slightly better. The European demand shows considerable improvement. An order for a dozen automatic machines has been placed for export as well as some small orders and some good inquiries are pending. The machine-tool dealers are getting a limited volume of orders for new and second-hand machines, these orders for the most part being for single tools. The Lima Locomotive Corporation has asked for approximate prices for 13 machines, but as the expenditure for this equipment has not yet been authorized, there is no certainty that the business will be placed at the present time. In handling equipment crane builders report that business is not bad and there is a fair demand for small hoists. The demand for locomotive cranes is not active, although a local builder has just taken an order for a 30-ton machine for shipment to the South. American textile plants and paper mills are being pushed to their fullest capacity, because of the increased business resulting from conditions growing out of the war and it is expected that the machinery trade will benefit somewhat from this activity. In electrical lines there is a fair demand for small motors and some inquiries are pending for large power-plant units.

Cleveland companies are preparing to submit bids for a 150-ton floating revolving crane, which the Navy Department will purchase for Norfolk, Va. The Government will receive bids for this crane January 15, 1915.

A large electric crane will be installed in the new assembling plant of the Ford Motor Company, Cleveland. The erection has just been started.

The Cleveland Electric Motor & Mfg. Company, Cleveland, has been incorporated with a capital stock of $10,000 by W. K. Stanley and others.

The Toledo-Ford Tire Company, Toledo, Ohio, recently incorporated with a capital stock of $350,000, will establish a plant for the manufacture of automobile tires. R. F. Teall, 9 Berkley Building, and others, are stockholders in the company.

The L. Hollerbach Piano Company, Toledo, Ohio, has acquired a site on which it plans eventually to build a piano factory.

The Buckeye Clay Pot Company, Toledo, Ohio, is erecting a plant on Pontiac street, Toledo. It will be 120 x 135 ft., and two stories.

It is announced that the Milburn Wagon Company, Toledo, Ohio, will begin the manufacture of a line of electric automobiles.

The Adamson Machine Company, Akron, Ohio, maker of automobile tire molds, will enlarge its plant with a brick, concrete and steel addition 80 x 100 ft., to be used for a foundry. Some new machinery will be installed.

Cincinnati

CINCINNATI, OHIO, September 28, 1914.

Persistent rumors are circulated indicating that a few machine-tool builders have received lately some attractive foreign orders. These cannot be confirmed at this time, but the addition to working forces in a few plants would tend to lend color to the truth of these reports. On the other hand, several firms have been compelled to make further reductions in their operating departments. With few exceptions, the domestic inquiry for different machine tools is reported to be improving. Some of these inquiries are doubtless duplicates, but the fact that they are coming from all sections of the country, with the exception of the South, is considered to be a hopeful sign. Probably the bulk of actual sales is to automobile and auto-truck manufacturers.

The leading local boiler and tank manufacturer reports a steady run of orders that has enabled a full force to be kept at work. Wood-working machinery is quiet, but small electrical equipment continues to move satisfactorily. No large orders are being received, but the aggregate of the scattered business coming in is somewhat encouraging. The situation with the jobbing foundries is improving. Local saddlery and harness manufacturers are very busy, supposedly filling foreign orders.

The Ford Motor Company, Detroit, Mich., has let contracts for the interior work of its assembling plant in Cincinnati now under course of construction. The building will be ready for the installation of the necessary machinery within 30 days.

Pollard & Ellms, engineers, Union Central Building, Cincinnati, are preparing plans for waterworks systems to be installed by the cities of Middletown and Xenia, Ohio. It is also understood that they will draw plans for the proposed municipal waterworks plant at Dayton, Ohio.

The Stewart Iron Works Company, Covington, Ky., will take over the plant of the Ahrens Iron Works Company, Colerain avenue, Cincinnati, which is in the hands of a receiver.

Cullen & Vaughn, Hamilton, Ohio, will soon ask for bids on heating equipment for a Y. M. C. A. building to be erected at Paris, Ky.

The Atlas Rubber & Belting Company, Cincinnati, has increased its capital stock from $1000 to $10,000.

The Standard Tire & Rubber Company, Willoughby, Ohio, has been incorporated with $100,000 capital stock, by Charles P. Shaw and others.

The Trump Mfg. Company, Springfield, Ohio, reports the receipt of a large order for water turbines from Karachi, India.

Birmingham

BIRMINGHAM, ALA., September 28, 1914.

A slight change for the better has taken place in the machinery market; but this does not apply to wood-working apparatus, in which line business is stagnant. Machine tools for mines and iron plants find a ready sale and some business is being done in gasoline engines. Transactions, however, are off in volume, as compared with the same period for many years.

The American Mining & Chemical Company, Birmingham, has been incorporated with a capital stock of $2000 by C. O. Jaggers, John G. Cooke and C. F. Avery to manufacture fertilizer. The capital stock is to be increased.

At a cost of $65,000 the North Birmingham Packing Company, Birmingham, will renovate its ice plant, increasing the capacity from 65 to 125 tons a day. C. H. Ungerman is president and Frederick Phillips, secretary

The Jefferson County Board of Revenue, Birmingham, has ordered advertising of bids for the erection of a $95,000 sewer disposal plant to be erected at once.

The Atlantic Stone Quarry Company, Atlanta, will begin the manufacture of granite paving blocks at Oglesby, Ga.

L. W. Coward, Claxton, Ga., will establish a sawmill in the place of the one recently burned.

The plant of the Kehoe Iron Works, Savannah, Ga., will be removed to the river front and enlarged.

The Builders' Mfg. Company, Pensacola, Fla., has been incorporated by George W. Owens and others to manufacture building material. The capital stock is $10,000.

The High Point Tile Roofing Company, High Point, N. C., has been incorporated with a capital stock of $25,000 to manufacture roofing tile.

The Pisgah Lumber Company, Asheville, N. C., was incorporated with a capital stock of $75,000.

The Acme Mattress & Supply Company, Spartanburg, S. C., desires prices on dies and machinery for soft leather stenciling and cutting.

The Central South

LOUISVILLE, KY., September 28, 1914.

Reports continue to indicate a rather slack demand for equipment of any kind. General business conditions in this section are not at all good, owing to the depression caused by the cotton situation, and favorable reports are being received from few industries. Wood-working lines usually call for a lot of machinery at this season, but owing to building being slow, the planing-mills have little to do, and the furniture factories are running less than half capacity. Coal mines are active, however, and are buying freely. The boiler makers seem particularly hard hit by prevailing dullness. Electrical equipment is moving fairly well, though few installations of size are being contracted for. Members of the trade look for a gradual improvement from now on, feeling that business has had sufficient time to adjust itself to war conditions.

The plant of the Grocers' Biscuit Company, 652 South Seventh street, Louisville, was destroyed by fire September 25 with a loss of $115,000. J. William Miller, president of the company, announced that it would be rebuilt at once. Boilers, engine, motors, conveying and packing machinery, besides special bakery equipment, will be needed.

The Federal Chemical Company, Lincoln Building, Louisville, is completing the erection of a fertilizer factory to take the place of that which was recently burned, and is ready to purchase and install the necessary equipment. Clarence Braden is in charge.

The Louisville & Nashville Railroad Company, Louisville, has let a contract for the erection of a roundhouse at Lexington, Ky., and has also started building repair shops there. Considerable equipment will be needed for these buildings.

The city of Louisville is planning the erection of a garage to take care of the large number of automobiles used by the municipality. The repair shop will require equipment. Address the board of public works.

Henderson, Ky., is building a new power house to serve its electric light system.

The Kentucky Utilities Company, Lexington, Ky., plans to install two 500-hp. boilers in its power plant at Varilla, Ky.

The Carlisle Electric Light & Power Company, Carlisle, Ky., which, as recently reported, is planning to add an ice factory, will install a 15 or 20-ton machine, and is now getting estimates on the equipment. M. V. Bastian is manager.

The Elkhorn Coal Company, Mater, Ky., is in the market for a considerable amount of equipment for a new mine, including boiler, engine, fan, stationary screens, retarding conveyor, etc. J. Henry Hall is in charge of purchases.

The Rex Revolving Light Company, Vine Grove, Ky., plans to manufacture an automobile light. The company is capitalized at $15,000. J. R. Davis should be addressed.

The George Bohon Company, Harrodsburg, Ky., manufacturer of vehicles and harness, is erecting an addition 100 x 100 ft. It will be equipped for blacksmithing.

The Fayette Produce Company, Lexington, Ky., has been organized with $10,000 capital stock, and will install refrigerating equipment. J. W. Lynch is president, and Thomas F. Lynch, general manager.

M. O. Prescott, Campbellsville, Ky., is equipping a garage, and plans to make a specialty of rebuilding automobiles.

S. M. Billiter, Williamstown, Ky., has purchased a site for a garage, which he will build at once. A motor and several machine tools will be needed for the repair shop.

The Catching Building, London, Ky., is in the market for an electric motor to operate a pump.

The Southern Locomotive Valve Gear Company, 603 Empire Building, Knoxville, Tenn., has been organized by H. P. Strayer and others and has established offices in the Empire Building. Plans for operating are now being formulated. It is reported to be seeking prices on foundry equipment.

The Embree Iron Company, 1740 West Adams street, Chicago, Ill., will build a concentrating mill on a zinc property at Embreeville, Tenn., it is announced. The machinery requirements in this connection are not yet decided.

The Atlas Machine & Garage Company, Memphis, Tenn., has been organized with $2000 capital stock by H. E. Bridges, J. C. Scott, J. C. Bailey, and others.

The Dandridge Power & Light Company, Dandridge, Tenn., which, as recently reported, is equipping an electric light plant, is also establishing an automobile garage and repair shop.

The Southern Railway, with general offices in Washington, D. C., has let the building contracts for shops and pump house at Buntyn, Tenn., near Memphis, and is ready to purchase equipment for these structures. In addition it will build and equip an 18-stall roundhouse, with a 90-ft., foot-power turntable, a reinforced concrete coal-handling plant, equipped with motor-driven conveying machinery; machine and boiler shop, a power plant and other facilities.

St. Louis

ST. LOUIS, MO., September 28, 1914.

Business in the machine-tool market continues to await the general readjustment that is regarded as necessary. There is, however, a steadily improving feeling.

The Ford Motor Company, St. Louis, has been granted a permit for the extension of its assembling plant and is reported to require some additional equipment.

The plant of the J. P. Materne Company, St. Louis, manufacturer of valves, hot-water apparatus and steamfitters' supplies, was damaged by fire about $20,000, September 25. Some equipment which was destroyed will be replaced.

The American Dairy & Ice Cream Company, St. Louis, has been incorporated with a capital stock of $25,000 by F. J. Thalgott, C. C. Longly and C. D. Davis to manufacture ice cream and dairy products.

Butler, Mo., will install two alternating current generators and allied apparatus to its lighting plant.

The board of aldermen, Kirkwood, Mo., has authorized improvements to its electric generating plant to cost about $17,000.

The Burdett Mfg. Company, Kansas City, Mo., has been incorporated with a capital stock of $75,000 by C. S. Van Noy, F. D. Glore, I. C. Van Noy, and others, to equip a large plant for the manufacture of mop yarn, etc. Wood-working equipment will also be installed. F. E. McCreitt is manager.

The McComas Hydroelectric Company, Edgerton, Mo., has been incorporated with a capital stock of $50,000 by Joseph M. McComas, George W. Johnson and Frank Davis and will build a generating plant.

The American Standard Automobile Company, Edwardsville, Ill., incorporated for $100,000, is equipping a factory with a capacity of 5000 cars annually. The incorporators are Henry Trares, Jr., J. E. Hillskoetter and Peter Barnhardt, Edwardsville, and H. B. Gardner, Chicago.

The Central Barrel Company, East St. Louis, of which Frank Tissler is president, has plans for the construction and equipment of an addition to its plant. Metal-working equipment will be needed.

The J. A. Reese Company, Blytheville, Ark., will install equipment to cost about $2500 for the manufacture of filters.

The sawmill of the Freeman-Smith Lumber Company, Millville, Ark., which has been destroyed by fire with a loss of about $40,000, will be replaced.

The Rock Island Coal Mining Company, Hartshorne, Okla., will install electric hoists and electric equipment.

The Sand Springs Machine Company, Sand Springs, Okla., has been incorporated with a capital stock of $75,000 by R. M. Halweg, H. C. Walters and D. G. Elliott, Tulsa.

The Southwest Silo Company, 619 West Main street, Oklahoma City, Okla., of which Arthur R. Moore is secretary, will establish a branch factory for the manufacture of metal silos. Bids on power presses, punches, dies and die holders and shears of large capacity are now being asked.

J. W. and J. R. Spurrier, and R. D. Rood, Bartlesville, Okla., will establish a plant for the manufacture of oil-burning devices and are in the market for machinery.

The Crystal Ice Cream & Bottling Works, Tupelo, Miss., is in the market for a 20-ton ice plant, etc. A. A. McLeran is manager.

The Clay County Cotton Oil Company, West Point, Miss., has acquired the plant of the Chickasaw Company, Houston, Miss., and will add to and improve the equipment.

The Alexandria Cotton Oil Company, Alexandria, La., has bought the plants of the Sonia Cotton Oil Company and the Dixie Gin Company and is repairing them, as well as installing much new equipment, including hullers, grinders and linters. About $80,000 is involved.

The city of Melville, La., will equip an electric light plant to cost about $15,000. W. L. Thompson, Boyce, La., is the engineer in charge.

The Reserve Natural Gas Company, Shreveport, La., organized by M. W. Bahan and others with a capital stock of $2,000,000, will equip a pipe line from the DeSoto field to Shreveport, with pumping machinery.

The M. W. Cady Lumber Company, McNary, La., will increase its capital stock from $300,000 to $800,000 for the purpose of extending its operations.

The Bay Poplar Lumber Company, Napoleonville, La., has been incorporated with a capital stock of $200,000 by G. J. LaBarre, William Lawes, Henry Dugas and Ulysses Hebert, and will establish mills.

A. G. and R. G. Little, Richardson, Miss., have organized the Graham Lumber Company and will build a mill of 20,000 ft. daily capacity at Talisheek, La.

The Claverie Mfg. Company, New Orleans, La., has been incorporated with a capital stock of $25,000 by August J. Claverie and others and will manufacture acetylene generators.

The Lyon-Barton Motor Car Company, New Orleans, La., will equip a repair shop and garage.

Plaquemine, La., has voted to expend $52,000 for waterworks plant extensions.

Texas

AUSTIN, TEXAS, September 26, 1914.

Improvement in the cotton marketing situation is to be noted since last week. Provision is being made for taking care of probably 2,000,000 bales of surplus cotton in Texas. This will make business conditions much easier and will have a direct influence for the better on the machinery trade.

The chamber of commerce of Temple is promoting the construction at that place of a window screen factory to cost about $40,000. A syndicate of St. Louis, Mo., men are back of the project.

The Neches Shell & Dredging Company, Beaumont, will install a dredging plant. J. C. Wilson is president.

The Aqua Pura Bottling Company, Houston, has been organized with a capital stock of $25,000 and will construct bottling works. A. J. Elliott is one of the principals.

The commissioners' court of Reeves County will create an irrigation district in the Toyah Valley near Balmorhea, and bonds in the sum of $350,000 will be issued to construct a water storage reservoir, install pumping plants, etc., for watering about 8000 acres of land.

The Wright-Herndon Company, Sweetwater, will construct a cold storage and packing plant, with a capacity of 10 carloads.

Michael Hale, Springerville, Ariz., will construct a water storage reservoir and install a pumping plant to irrigate several thousand acres of land.

San Francisco

SAN FRANCISCO, CAL., September 22, 1914.

The machinery trade, though still quiet, shows some indications of betterment. Inquiries in many lines are taking more definite shape. The lumber industry is a principal factor in the business of this section and until it is restored to normal no real activity is expected. Curtailment among the mills is still quite general, and while some logging camps are resuming work nothing has appeared to indicate a general resumption of export trade. The opening of the Atlantic market through the Panama Canal is giving some slight relief. Conditions in the interior are fairly good, and small orders in connection with agricultural development are numerous; although progress on large projects is very much retarded. Inquiries for mining equipment from the mountain districts are more in evidence. A general curtailment in dredging operations along the coast is noted.

The Wood Livestock Company, Ltd., Spencer, Idaho, is preparing to build an electric light and power plant for that town.

The plant of the Nevada Engineering Works, Reno, was destroyed September 14 by fire. The foundry only was saved. The loss included $42,000 on the plant and $8000 on work under construction. A large number of valuable mining machinery patterns were destroyed. P. F. Bragg, the proprietor, states that he will rebuild.

The California Fireproofing Company, 401 Bankers Investment Building, San Francisco, Cal., has been organized by W. F. and S. W. Barnes, and others, to manufacture tile, pipe, etc. It has built and equipped a plant at Antioch, Cal.

The Pacific Northwest

SEATTLE, WASH., September 22, 1914.

Contrary to predictions forecasting a curtailment of imports into the customs district of Washington, as a result of the war, the monthly report for August shows a gain of $1,045,964 over imports for August of last year. These figures show that the portion of America's commerce which centers on the Pacific coast has not suffered by the unsettled condition of the European and Oriental markets. The machine-tool market shows little change, with orders few and far between.

The American Falls Pressed Brick Company, American Falls, Idaho, is having plans prepared for the erection of a brick plant. F. B. Wedel is president and P. D. Weber, secretary.

The joint board of commissioners of King and Pierce counties will hold a meeting in Seattle on October 10 to award the contract for an electric dredge.

The Preton Shaffer Milling Company, Waitsburg, Wash., is making improvements and alterations to its plant. New machinery will be installed, including a belt conveyor.

The August Valley sawmill, Lakeview, Ore., which was recently destroyed by fire, will be rebuilt at once by C. S. Reed, of Lakeview. The plant will be rebuilt on the old site, and will have a much larger output than the previous mill.

Louis Graham, Battle Creek, Mich., has purchased a site near St. Maries, Idaho, on which he will erect a sawmill.

The Butler Contracting Company, Seattle, which was recently awarded the contract for the construction of the $250,000 grain elevator for the Seattle Port Commission is now receiving sub-bids for the work.

A permit for the erection of a two-story brick factory to cost about $10,000 has been issued to E. H. Ingham, 118 Harold avenue, Portland, Ore.

The Glasgow Flour Mill, Glasgow, Mont., which was recently burned, will be rebuilt on a larger scale.

The C. O. Farm Implement Company, Idaho Falls, Idaho, has secured an option on a site on which it expects to erect a factory.

A large grain elevator is to be erected in Box Elder, Mont., by the Rock Mountain Elevator Company, of that city. Plans are practically completed.

James Henry, Western and Marion streets, Seattle, will erect a two-story cold storage plant to cost about $3000.

The Sidney Light & Power Company, Sidney, Mont., has been incorporated, and work has been started on a power plant.

Eastern Canada

TORONTO, September 26, 1914.

The City Council, Ottawa, Ont., has instructed the board of control to commence work at once on the Ottawa River supply works system which will cost $2,000,000. The George W. Fuller Company, New York, is consulting engineer. Archibald Currie, City Hall, Ottawa, is city engineer.

Plans have been prepared by Procter & Gamble, Cincinnati, Ohio, for the construction of a factory at Hamilton, Ont., to cost $1,000,000. Construction work will be started in about a month. No contracts have been let.

The Town Council, Simcoe, Ont., will construct a hydro-electric power plant including a sub-station, etc., to cost $40,000. W. C. McCall is town clerk.

Machinery is now being installed in the $30,000 plant of the Electric Steel & Metal Company, Welland, Ont. Work on three other buildings which will complete the plant for treatment of steel and iron ores by electric process, will be started next spring.

The ratepayers of Lindsay, Ont., passed a by-law to grant $7000 for additions to the waterworks plant.

The Vapo Company, Ltd., Toronto, has been incorporated with a capital stock of $100,000 by James E. Day, Samuel C. Arrell, Joseph P. Walsh, and others, to manufacture renovating and cleaning machinery, etc.

The Canadian branch of the National Cash Register Company, Dayton, Ohio, has been incorporated in Ontario with a capital stock of $600,000.

The Canadian business of Jacob & Joseph Kohn, 110 to 112 West Twenty-seventh street, New York, manufacturers of bentwood furniture, has been incorporated in Ontario with a capital stock of $40,000.

The Hydroelectric Commission, Peterborough, Ont., will make large additions to its plant and system to cost $100,000.

The City Council, Quebec, Que., is contemplating the erection of a boiler room on Beauport road to cost $150,000. The building will be of steel and brick construction. J. L. Pinsonnault, City Hall, Quebec, is the architect.

Western Canada

WINNIPEG, MAN., September 25, 1914.

The Canyon City Saw Mills Company, Ltd., Regina, Sask., has been incorporated with a capital stock of $15,000 by D. W. Briggs and others. It is erecting a sawmill and plans the construction of others in western Canada.

The Farney Truck Company, Ltd., Edmonton, Alberta, has been incorporated with a capital stock of $25,000 to manufacture motor trucks, etc.

The Planet Elevator Company, Saskatoon, Sask., has been incorporated with a capital stock of $50,000 to build and operate elevators.

The Great Western Furniture Company, Ltd., Saskatoon, Sask., has been incorporated with a capital stock of $50,000 to manufacture furniture, etc.

The British Columbia Sheet Metal Works, Ltd., Vancouver, B. C., has been incorporated with a capital stock of $10,000.

The Colonial Brewing Company, Ltd., Vancouver, B. C., has been recently organized with a capital stock of $400,000. Provisional directors are R. L. Reid, D. S. Wallbridge, Bruce Boyd, W. Reilly and W. Murray, Vancouver.

Government Purchases

WASHINGTON, D. C., September 28, 1914.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until October 20, schedule 7393, two gasoline engines for Norfolk; until October 27, schedule 7371, one water-tube boiler and one bracket jib crane, both for Puget Sound; schedule 7386, six ¼-hp. portable ventilating sets for Mare Island and 10 of the same for Brooklyn.

The following bids were received by the Bureau of Supplies and Accounts, Navy Department, Washington, September 22:

Schedule 7202, Steam Engineering

Class 21, Puget Sound—Two air compressors and governors—Gardner Governor Company, units; A. E. Hoermann, units, part.

Schedule 7237, Ordnance

Class 71, Newport—Two turbine bucket-cutting machines—E. W. Bliss Company, $1850.

Schedule 7241, Construction and Repair

Class 83, Boston—One oxy-acetylene cutting machine—Davis-Bournonville Company, $1825.

Schedule 7251, Construction and Repair

Class 118, Brooklyn—One mechanically-guided cutting device—Davis-Bournonville Company, $540.

Morrison & Co., engineers and merchants, Valparaiso, Chile, whose New York offices are at 17 State street, recently secured the major part of the Chilean navy contracts for general supplies for a period of three years. Two similar contracts for these supplies secured by this firm were for periods of five years each.

The Trussed Concrete Steel Company, Youngstown, Ohio, has received a large order for reinforcing steel for an addition to the Massachusetts Institute of Technology and other orders for material for the Hippodrome Theater and Y. M. C. A. building in Youngstown.

Trade Publications

Clutches.—Hilliard Clutch & Machinery Company, Elmira, N. Y., Catalogue A. Covers a line of friction clutches and cut-off couplings in which the two friction plates are drawn against the friction ring by screws operated by spiral racks attached to the sliding collar which transmit power through a set of spiral gears. Illustrations of the clutch assembled and taken apart are presented, together with tables giving the standard range of bores, sleeves, sleeve lengths, etc., and the dimensions of the various parts. An illustrated description of the clutch appeared in *The Iron Age*, December 3, 1910.

Iron Specialties.—Waldo Bros., 45-49 Batterymarch street, Boston, Mass. Pamphlet. Refers to a line of masons' and contractors' supplies, such as sewer gratings, manhole and sidewalk covers, wall ties and wheelbarrows. All of these are illustrated with brief descriptions and short tables of the sizes in which they can be furnished.

Railroad and Factory Supplies.—Walter A. Zelnicker Supply Company, St. Louis, Mo. Folder. Calls attention to a varied line of factory supplies, such as car movers, door rollers and seals, whistles, marking crayons, fire buckets and a portable hydraulic wheel press. All of the various appliances are illustrated with a brief description of the different sizes that can be furnished.

Roller Jaw Chucks.—Weaver Mfg. Co., Springfield, Ill. Circular No. 10. Illustrates and describes a chuck in which the gripping is done by three hardened tool steel rolls or jaws. The special features claimed for the chuck are that it is self-tightening and that it is driven from the body. A number of views of the chuck taken apart to show the mechanism which consists of only five parts are presented, together with a table of the sizes in which it is made.

Lubricating Device.—Knowles & Wollaston, 218 Queen's road, Battersea, London, S. W., England. Pamphlet. Points out the advantages of the K. & W. automatic graphiter for the lubrication of steam and gas engines. After a brief discussion of the advantages of graphite cylinder lubrication, the construction of the device is taken up at some length with a drawing showing the arrangement of the various parts. The advantages claimed for the use of the device are reductions in the cost of cylinder lubrication and the amount of fuel consumed as well as in the wear of the slide valve and piston rings and an increase in the available power of the engine. Figures on the quantity of oil and graphite required to lubricate different types of engines are presented, together with installation views showing the application of the device to a locomotive, vertical and horizontal steam engines and gas engines. A partial list of users is included.

Rivets.—Atlas Tack Company, Fairhaven, Mass. Catalogue No. 61. Mentions the various sizes and styles of iron rivets that can be furnished either coppered, brassed, tinned, bright or black, and rivets of copper, brass or aluminum. Illustrations of the various types of standard rivets that can be furnished are given, followed by dimension diagrams of the different heads. The sizes of rivets which are considered as regular are given, followed by illustrations of tinners', wheel, barrel, hame, cooper and carriage rivets that are made, with brief tables of the sizes in which they can be furnished. A number of illustrations of special rivets which can be supplied up to a maximum diameter of 7/16 in. and a length of 6 in. are presented.

Metal Working Machines.—Gowanda Agricultural Works, Gowanda, N. Y. Circular. Illustrations and descriptive matter explain the operation of a line of metal working machinery, which includes power shearing and bench drilling machines. The shearing machines are made in two sizes for cutting sheet steel up to 24 in. in width. The drilling machines are of the single-spindle sensitive type and are made in two different styles, one with a bow frame, while the other has a single column at the back.

Air Compressor Unloader.—Yarnall-Waring Company, Chestnut Hill, Philadelphia, Pa. Four circulars. Mention the construction and uses of the Richards unloader for air compressors which is designed to stop and start the driving motor when the maximum or minimum load is reached or to keep the load off the motor until it has come up to operating speed. A brief description of the construction of the unloader is given, together with a number of illustrations and a table of the sizes in which it can be supplied. An illustrated description of this unloader appeared in *The Iron Age*, July 30, 1914.

Internal Combustion Engines.—Goold, Shapley & Muir Company, Ltd., Brantford, Canada. Catalogue. Describes a line of internal combustion engines using gas or gasoline as fuel which are built in a number of sizes ranging from 1½ to 45 hp. The engines are built in the stationary, skid and truck mounted and traction types. The text matter describing the engines is supplemented by a number of engravings of the various parts and the several sizes and styles. A number of engravings showing the engines in use are presented, together with a number of testimonial letters.

Portable Floor Crane and Hoist.—Canton Foundry & Machine Company, Canton, Ohio. Circular No. 39. Presents a brief description of a portable floor crane and hoist which is equipped with back gears. The special feature of the crane is that the load can be lifted either on the back gear or with the single gear, as both shafts are squared to receive the crank used in operation. The hoist is designed for handling loads between 3000 and 6000 lb. An illustration of the crane is given, together with a brief table of dimensions.

Reversing Gear.—Gies Gear Company, 45 East Fort street, Detroit, Mich. Pamphlet. Mentions a reversing gear for use with a gasoline engine. Illustrations of the inclosed and open styles of gear are presented, together with dimension diagrams. Instructions on the installation and adjustment of the gear are given. A numbered price list of repair parts is included.

Drop Presses.—Peck Drop Press Works, New Haven, Conn. Catalogue. Describes and illustrates a line of drop presses of the poppet type for stamping sheet metal, etc. These presses are designed for handling light work where accurate matching of the dies is required as well for large work such as metal ceiling plates. Mention is also made of an independent device for raising the drop after the blow has been struck. This is designed for operation by the foot, thus leaving both hands free to handle the work being done.

Motors for Buffing and Grinding Lathes.—Robbins & Myers Company, Springfield, Ohio. Bulletin No. 115 superseding No. 79. Illustrates a line of motors for small buffing and grinding lathes handling light work. Either alternating or direct current motors can be supplied and either a double-end grinding or a combination grinding and buffing outfit can be furnished. Illustrated descriptions of the different lathes are presented together with specifications and tables of motor ratings.

Cutter Grinding Machine.—Ingersoll Milling Machine Company, Rockford, Ill. Catalogue No. 35. Pertains to a new cutter grinding machine for grinding face milling cutters ranging from 4½ to 36 in. in diameter. The machine is intended to do the work at one setting of the cutter, the faces, sides and corners of the teeth being ground without resetting. A brief description of the construction of the machine is given, the text being supplemented by numerous engravings of the machine and some of its parts arranged for grinding cutters. Specification tables and a cross-sectional elevation of the machine are included.

Weight Calculating Instrument.—Pittsburgh Instrument & Machine Company, 236 Third avenue, Pittsburgh, Pa. Circular. Relates to a device for calculating the weights of carwheels, gears and other circular articles. It operates on the same principle as a planimeter and is intended to be used on a drawing board for articles of any size and diameter. A description of the device and its uses is presented and the text is supplemented by a number of engravings showing its construction and method of using.

Metal Working Machinery.—Garvin Machine Company, Spring and Varick streets, New York City. Circular No. 212. Refers to a line of special and standard machines for the manufacture of automobile parts and accessories. The machines shown include vertical and duplex milling, drilling and tapping machines. Among the machines covered are a double-spindle milling machine and a special copper coil forming machine which were illustrated in *The Iron Age*, July 10, 1913, and July 23, 1914, respectively.

Arc Welding.—Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa. Section No. 3049-A of catalogue No. 3002-A. Devoted to the subject of electric arc welding with data on the carbon and metal electrode processes and the apparatus required. Instructions on the method of making welds are given and the text is supplemented by a number of engravings and drawings showing repairs made in this way and the manner in which the apparatus is arranged.

Regrinding Valves.—National Tube Company, Frick Building, Pittsburgh, Pa. Bulletin No. 7-D. Devoted to regrinding valves. A feature of the bulletin is a set of illustrations showing a valve which was opened and closed 327,094 times before being reground, and after having been reground several times is still in use after being opened and closed over 3,046,280 times.

Wood-Working Machinery.—Crescent Machine Company, Leetonia, Ohio. Catalogue. Size, 4 x 6 in.; pages, 143. Concerned with a line of wood-working machinery, the special features of which are a universal machine that can be supplied in 12 combinations, a remodeled surfacing machine that has been improved by the addition of a variable friction feed, and the use of improved fenders on the band-sawing machines. All of the various machines comprised in the line

are illustrated and in some cases the descriptions are quite complete with halftone engravings of various parts. An illustrated description of one of the universal wood-working machines appeared in *The Iron Age*, June 11, 1914.

Iron Cement.—Smooth-On Mfg. Company, 572 Communipaw avenue, Jersey City, N. J. Instruction Book No. 15. Is the most complete instruction book that has been issued by the company, as it tells about eight different cements, a concrete iron paint and a line of corrugated iron gaskets, each of which formerly had its own separate book. The various uses of the different products are briefly described, together with illustrations of a number of repairs that have been made by their use. Instructions for applying the various cements are given, and a number of testimonial letters are included.

Pumps and Gears.—Earle Gear & Machine Company, Philadelphia, Pa. Two folders. The first describes by illustrations and comprehensive captions a line of centrifugal pumps that are built in the single and double suction and multi-stage patterns with horizontal and vertical shafts for all purposes. Among the pumps shown is a vertical single-suction pump which was illustrated in *The Iron Age*, November 20, 1913. The other folder gives a number of illustrations of gears of the spur, bevel, miter, worm, herringbone and spiral types that have been turned out by this company. One of the gears illustrated is a nickel-steel bevel gear 75 in. in diameter, with a 20-in. face. Two views of the plant in which the gears are produced are included.

Firebrick.—Evens & Howard Firebrick Company, 316 Market street, St. Louis, Mo. Pamphlet. Relates to a line of firebrick and refractory material for blast and open-hearth furnaces, hot-blast stoves, coke ovens, cupolas, kilns, boiler settings, etc. The various brands are reproduced, with brief descriptions of their properties, and several illustrations of the various shapes that are regularly carried in stock are presented. Tables of the sizes in which the brick can be supplied are given, together with others showing the number of arch, wedge and key bricks required for circles of various diameters.

Mine Cars and Fans.—Harris-Stevens Company, First National Bank Building, Pittsburgh, Pa. Four circulars, Show portions of a complete line of mine equipment that can be supplied by the company. These include mine cars with both wooden and steel sides and ends and a centrifugal mine fan which can be furnished in either high or low speed to meet varying conditions. Brief descriptions of the cars and fans are given and mention is also made of a special line of mine carwheels.

Metals and Alloys.—Electric Smelting & Aluminum Company, Lockport, N. Y. Two booklets. The first deals with the various alloys of aluminum and copper that are produced by this company, with brief descriptions of their properties and uses and illustrations of the form in which the ingots are cast. Mention is also made of a line of babbitt metal and solder in which special grades can be supplied to order. The other pamphlet treats of a mineral cleaner for use in plants manufacturing metal goods. This cleaner is made by combining several oxides and minerals in such a manner that the product unites chemically with alkali. The special advantages of the cleaner are that it has no causticity, does not deteriorate on exposure and is easy to handle. Instructions on the use of this cleaner are included.

Chains.—Union Chain & Mfg. Company, Seville, Ohio. Two pamphlets. The first pertains to a detachable chain which was illustrated in *The Iron Age*, August 21, 1913. The special feature of this chain is that the bushing pins, when worn, can be turned half way round. The second booklet, No. 2, is a brief thesis on Union chains and comparative chain values, based on results of tests of the chains made by various universities.

Patternmaker's Grinding Machine.—Charles H. Besly & Co., 118 North Clinton street, Chicago, Ill. Mailing card. Illustrates and briefly describes a combination disk-grinding and drum-sanding machine. It is claimed for this machine that flat surfaces and external curves as well as straight and curved internal surfaces can be ground readily. A number of brief testimonials are included.

Ladder and Follower Plates.—Allegheny Forging Company, Pittsburgh, Pa. Leaflets F-1 and L-1. The first illustrates a line of follower plates which can be supplied in different shapes with the sizes and the numbers of the plates printed on the drawing. The second describes briefly and illustrates a ladder for attachment to cars or the sides of buildings, which is made of open-hearth steel entirely.

Rust-resisting Iron.—American Rolling Mill Company, Middletown, Ohio. Pamphlet, entitled "Defeating Rust." Treats of a condition, a discovery and the application of the remedy. After a brief historical account of the uses of pure iron, a list is presented of the various uses now made of it in the form of sheet metal, wire fencing, roofing, metal shingles, etc. A brief description of the process of manufacture is given followed by illustrations of the uses that have been made of the material in tanks, culverts, metal lathing, etc. A number of tables of weights are included.

Becker Molding Frame.—Peerless Foundry Company, Hamilton, Ohio. Illustrated pamphlet. Sets forth the special features of a molding device which was illustrated and described in *The Iron Age*, July 30, 1914. The brochure is handsomely gotten up and gives cogent reasons for the use of this addition to molding-machine equipment in the interest of foundry efficiency and economy.

Bedstead Tubing.—The National Tube Company, Frick Building, Pittsburgh. Bulletin No. 21. Contains information and data on the use of National tubing in the manufacture of modern steel beds, cribs, bungalow beds and bed springs. One fact pointed out is that the bed is absolutely sanitary, hospitals and hotels throughout the country having adopted it for this reason. Other advantages in the way of its cleanliness, convenience, durability and attractive appearance are pointed out.

Traffic of Isthmian Railroads Compared

WASHINGTON, D. C., September 29, 1914.—Apropos of the opening of the Panama Canal, the Bureau of Navigation of the Department of Commerce has prepared an interesting report on the traffic of the Panama and Tehuantepec railroad systems since the establishment of the former in 1869 and of the latter in 1907.

The value of merchandise passing between New York and other Atlantic coast ports to San Francisco and other Pacific coast points via the Panama Railroad has exhibited marked fluctuations in the last 45 years. With the opening of the Panama Canal to the traffic of the world the Panama Railroad has practically ceased to be a factor in the interchange of goods between the East and West coast sections of the United States.

In 1869 $70,000,000 worth of American products was moved across the isthmus via the Panama Railroad. In 1879, a decade after the opening of the first great transcontinental railroad, the total value dropped to $5,000,000, and by 1889 had further decreased to $3,000,000. In the period from 1900 to 1906, during which time this transisthmian traffic was restricted by competition from the great coast-to-coast railroads of the United States, but antedating the opening of the Tehuantepec Railroad, the value of American merchandise moved over the Panama line gradually increased until it reached $8,500,000 in 1902, receding again to $5,750,000 in 1906.

The Tehuantepec Railroad was opened to traffic January 1, 1907, and its influence on shipments via the Panama Railroad was immediately reflected in the figures for that year. For the entire fiscal year ended June 30, 1907, the value of merchandise moving between New York and other Atlantic ports and San Francisco over the Panama Railroad was $5,500,000, while for the last half of that year the value moved over the Tehuantepec line, including Hawaiian shipments, was over $11,000,000. In the period from 1907 to 1913 traffic over both lines increased, domestic shipments via Panama showing a total of $18,000,000 and those via Tehuantepec $94,000,000. These figures are exclusive of American shipments to foreign countries, which included $12,000,000 via Panama and $6,500,000 via Tehuantepec in 1913.

In the fiscal year 1914 the value of domestic traffic moved over the Panama line was $21,000,000, while that via Tehuantepec decreased to $67,000,000, this falling off being due, in part, to the war in Mexico in the latter part of 1913. Shipments to foreign countries via the Panama line aggregated $13,500,000 and those via the Tehuantepec Railroad $6,000,000.

Goods moved westward include many lines, such as iron and steel, cars and carriages, chemicals and drugs, cotton cloth and wearing apparel, explosives, twine and cordage, fish, glassware, boots and shoes, oilcloths, paints and varnishes, printing paper and books, soap, cosmetics, perfumeries, wood and woolen manufactures, and tobacco. Hawaiian sugar comprises one-third of the total value of goods shipped via the two railroads eastward to domestic ports, other important freights being canned salmon, fruits, wines, vegetables, copper, quicksilver, and wool. Of the Hawaiian sugar thus moved, all went via the Tehuantepec line. W. L. C.